WHITE PINE BLISTER RUST CONTROL

IN THE

NORTHWESTERN REGION

January 1 to December 31, 1944

United States Department of Agriculture
Bureau of Entomology and Plant Quarantine
Division of Plant Disease Control
Blister Rust Control
618 Realty Building
Spokane, Washington

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WHITE PINE BLISTER RUST CONTROL IN THE NORTHWESTERN REGION

January 1 to December 31, 1944

Herman E. Swanson, Regional Leader

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1944 Field Season

White pine blister rust control work was conducted on national forests, national parks, and state and private lands during 1944 in the Northwestern Region under the general leadership and technical direction of the Bureau of Entomology and Plant Quarantine cooperating with federal, state and private agencies. Work on national forests and national parks was directly supervised by the Forest Service and National Park Service respectively. This section of the report deals with the blister rust situation in the region and is followed by reports on: (1) State and Private lands, (2) National Forests, and (3) National Parks. In addition, detailed operation reports covering individual territorial units and reports on control investigations are presented.

Progress. During 1944, a total of 37,466 acres were worked including 7,714 acres of initial and 29,752 acres of second and third working. With blister rust spreading and intensifying on many areas ahead of the establishment of control, the 1944 accomplishment in relation to what needs to be done is only a holding action at the best. Progress in 1944 was held back by the greater than normal demand for blister rust crews on fire and yet the progress surpassed that of 1943 by the small margin of 719 acres.

Labor. Teen-aged boys again made up the bulk of the field crew. Approximately 1,400 boys were employed at the peak of the season. Other types of labor were utilized in so far as possible, the most important of these being 155 German internees employed by the Forest Service. These were largely resident aliens and were the most stable labor on the project. Results on employment of Mexican Nationals were not so successful. Of three Forest Service camps manned with Mexicans, two camps were terminated after a short period and one camp operated successfully to the end of the season. The work on Glacier National Park was performed by a crew of 15 Civilian Public Service workers. The blister rust program employed 1,585 workers at the peak of the season.

Infection Conditions. Blister rust is continuing to take a heavy toll of white pine in the recently established unprotected stands. The acreage of these young stands is increasing rapidly as a result of the logging of mature stands. The year 1944 did not appear to be a favorable one for spread of the rust from ribes to pine. Similar predictions for 1942 and 1943 were accurate as field surveys and investigations failed to find any significant infections on pine originating in these years. Only a small amount of new infection on pine has occurred since the last serious spread in 1941. If past history in rust behavior repeats itself in that every fourth year represents one of extremely heavy rust spread, 1945 will be a very bad year for spread and intensification of the rust.

Scouting activities in 1944 revealed two extensions in the spread of blister rust, one on ribes and one on pine. Cronartium ribicola was found for the first time in Yellowstone National Park. Positive identification was made of the rust found on Ribes petiolare located in Clematis Gulch in the Mammoth area. Blister rust was also found on Pinus flexilis in the Two Medicine Lake area in Glacier National Park. This is the first reported infection on P. flexilis in its natural range and the first pine infection reported east of the Continental Divide in western United States. These pine infections appeared to be of 1937 origin.

Summary of Progress

In the states of Idaho, Montana and Washington, the present net control area comprises 2,615,436 acres of which 1,755,056 acres representing 67 percent have been initially worked, 401,464 acres have been given second working and 79,324 acres, third working. The acreage on maintenance amounts to 649,030 acres or 25 percent of the total control area.

The present unworked acreage amounts to 860,380 acres. Of this, 6,803 acres are in Glacier National Park and 853,577 acres in the commercial white pine area of the Inland Empire. A large portion of this unworked acreage in the Inland Empire is cutover lands, 108,468 acres being logged 1940-1944 and 248,647 acres being logged primarily in the 1930-1939 period. Approximately 239,096 acres representing 67 percent of the unworked cutover acreage are classed in a deferred status because the present condition of the areas may preclude the establishment of a new white pine crop. The condition is generally attributable to a residual stand of other species sufficient to prevent the introduction and growth of white pine seedlings. The final disposition of these areas in the blister rust control program will be dependent on the future utilization of the mixed species and the manner in which the tracts are managed. It appears that at least 116,000 acres of cutover lands will be dropped from the control area in the near future as no longer being white pine type.

Another large unworked acreage, 166,847 acres, is natural white pine reproduction established on other than cutover areas in the period 1910-1939. Approximately 73 percent, 121,843 acres, is classed in a deferred status as not being of high priority. In this acreage 54,000 acres appear not to warrant the cost of control and 15,000 acres may be dropped because of the great amount of pine infection already present.

There are 200,855 acres of mature white pine which have not been worked and are also in a deferred classification. A careful analysis of these areas should be made when an expanded field program materializes. While mature stands generally do not contain heavy ribes populations, portions of these stands often are exposed to highly susceptible ribes along stream courses and on open ridges. It is highly possible that some damaging infection is already present in localized areas which may become evident within the next 10 or 20 years. To hold damage to a minimum, these areas of mature white pine should be studied from the standpoint of when they will be logged and for those

which will not be logged within the next 20 years, a survey should be conducted to determine the ribes population and infection hazard.

In summarizing the above, approximately 562,000 acres as yet unworked are in a deferred status. The remaining 298,000 acres with 104,000 acres yet to be classified represent the maximum unworked area which may be in immediate need of control work. It must be recognized that this work load is subject to change depending upon future utilization of residual mixed timber on the cut-over areas and the extent to which white pine becomes reestablished on much of this deferred area either by natural or artificial means.

Since most of the more valuable white pine areas have received some ribes eradication work, the major problem in the region is to complete the rework necessary to establish permanent control. Control effort has been primarily directed toward this end for the last several years and the only extension of work to new areas has been to protect particularly valuable stands, many of which are young white pine on recently logged areas located on the best white pine producing land in the territory.

Two innovations were made this year in the progress tables of the Inland Empire report and the individual operation reports in order to show more adequately the net accomplishments of the control program. The first deals with the designation of "eradication types" according to year of origin and in the case of the more recently established white pine areas, whether they are a result of cutover, burn or planting. In the future, these new stands will be grouped in five-year periods according to year of origin.

In the second place, a distinction has been made between the gross acreage reported as worked in each type and the net acreage, both worked and unworked, still being retained in the control area. This was accomplished by adding a column to the all years summary of ribes eradication by types, showing the net acres remaining in the control area. In the past, these tables have merely shown the accumulative progress without regard to important changes which have occurred in the control area since the control work was started. For example, since 1923 first working has been performed on 707,431 acres supporting mature stands of white pine. At the present time 569,118 acres of these worked mature stands remain, the rest having been logged. The 138,313 acres which have been logged are now classed as cutover, a type which supports numerous ribes as a result of the logging disturbance, or have been dropped from the control area where the conditions indicated that the area would not come back to white pine. The showing of net acres together with gross acres will also account for the acreage in the various types which was dropped because the rust outstripped the progress of control or the values did not warrant further cost incurrence.

The present type designations and the listing of "net acres" remaining in the control area are a great improvement in showing the work status and also providing a more complete inventory of the control area. Tables relating to progress by land ownership deal with net acres.

Allotments and Expenditures

Allotments and expenditures are presented in this section for the Bureau of Entomology and Plant Quarantine. Similar statements are presented for the Forest Service and the National Park Service in the reports of work on National Forests and National Parks. Summaries of the expenditures for all agencies are presented in the omnibus tables following this section of the report. In these tables emergency funds also included cost of CCC work valued at $1.50 per man-day on control work.

Bureau of Entomology and Plant Quarantine:

Allotments

Federal Funds	Fiscal Year 1944	Fiscal Year 1945
Work Project BLR-1-4	$ 93,700.00	$ 88,675.00
Work Project BLR-3-4	68,538.00	64,870.00
Total	$162,238.00	$153,545.00
Cooperative Funds*		
State of Idaho	$ 10,000.00	$ 15,000.00
Clearwater Timber Protective Assn.	6,781.18	6,413.72
Potlatch Timber Protective Assn.	4,959.06	5,174.28
Priest Lake Timber Protective Assn.	4,259.42	4,235.26
Total	$ 25,999.66	$ 30,823.26

*Funds deposited or in process of transfer to U. S. Treasurer for direct expenditure by Bureau of Entomology and Plant Quarantine.

Expenditures - Calendar Year, 1944

State	B.E.P.Q. BLR-1-4	B.E.P.Q. BLR-3-4	Federal Total	Cooperative*	Total
Idaho	$77,043.75	$79,477.33	$156,521.08	$28,119.58	$184,640.66
Montana	7,368.47		7,368.47		7,368.47
Washington	6,203.96		6,203.96		6,203.96
Wyoming	857.15		857.15		857.15
Total	$91,473.33	$79,477.33	$170,950.66	$28,119.58	$199,070.24

*State - $12,506.60, Private - $15,612.98

Expenditures - 1922 to 1944

State	Regular	Emergency*	Cooperative**	Total
Idaho	$1,670,143.14	$3,472,982.33	$322,792.11	$5,465,917.58
Montana	227,118.34	285,153.90		512,272.24
Washington	238,788.47	564,312.47		803,100.94
Subtotal	$2,136,049.95	$4,322,448.70	$322,792.11	$6,781,290.76
Colorado	11,852.04	67,437.96		79,290.00
Wyoming	12,171.43	65,391.37		77,562.80
Subtotal	$ 24,023.47	$ 132,829.33		$ 156,852.80
Grand Total	$2,160,073.42	$4,455,278.03	$322,792.11	$6,938,143.56

*Emergency funds - ERA(WPA) $3,775,781.16, NIRA(PWA) $679,496.87

**State - $187,211.64, Private - $135,580.47

TABLE 1

SUMMARY OF RIBES ERADICATION AND OTHER CONTROL WORK BY STATES AND OPERATING AGENCIES - 1944

State	Operating Agency	First Working						Second and Other Workings						Acres Second Working Only
		Acres	Ribes Destroyed	Man-Days	Per Acre			Acres	Ribes Destroyed	Man-Days	Per Acre			
					Ribes	Man-Days	Cost				Ribes	Man-Days	Cost	
Idaho	BEPQ	1,531	417,441	3,440	273	2.25	$19.31	7,874	444,279	9,051	56	1.15	$ 9.91	3,504
	FS	3,586	263,841	3,781	74	1.05	15.17	11,451	512,241	19,486	45	1.70	24.60	5,725
	Subtotal	5,117	681,282	7,221	133	1.41	17.49	19,325	956,520	28,537	49	1.48	18.34	9,229
Montana	FS	4,684	350,741	3,587	75	.77	8.06	1,301	126,498	3,226	97	2.48	26.11	1,085
	NPS							206	33,976	204	165	.99	*1.75	162
	Subtotal	4,684	350,741	3,587	75	.77	8.06	1,507	160,474	3,430	106	2.28	22.78	1,247
Washington	FS	757	178,714	849	236	1.12	12.32	5,440	309,648	5,340	57	.98	10.79	2,553
	NPS							636	9,515	561	15	.88	8.88	
	Subtotal	757	178,714	849	236	1.12	12.32	6,076	319,163	5,901	53	.97	10.59	2,553
All States	BEPQ	1,531	417,441	3,440	273	2.25	19.31	7,874	444,279	9,051	56	1.15	9.91	3,504
	FS	9,027	793,296	8,217	88	.91	11.95	18,192	948,387	28,052	52	1.54	20.23	9,363
	NPS							842	43,491	765	52	.91	7.13	162
Total		10,558	1,210,737	11,657	115	1.10	$13.14	26,908	1,436,157	37,868	53	1.41	$16.75	13,029

State	Operating Agency	All Workings						Number Camps	Number Employees	Treatment Infected Pines	
		Acres	Ribes Destroyed	Man-Days	Per Acre					Pines Treated	Man-Days
					Ribes	Man-Days	Cost				
Idaho	BEPQ	9,405	861,720	12,491	92	1.33	$11.44	7	337		
	FS	15,037	776,082	23,267	52	1.55	22.35	16	854	17,133	151
	Subtotal	24,442	1,637,802	35,758	67	1.46	18.15	23	1,191	17,133	151
Montana	FS	5,985	477,239	6,813	80	1.14	11.99	3	198		
	NPS	206	33,976	204	165	.99	1.75	1	15		
	Subtotal	6,191	511,215	7,017	83	1.13	11.64	4	213		
Washington	FS	6,197	488,362	6,189	79	1.00	10.98	4	141		
	NPS	636	9,515	561	15	.88	8.88	1	40	24,621	586
	Subtotal	6,833	497,877	6,750	73	.99	10.78	5	181	24,621	586
All States	BEPQ	9,405	861,720	12,491	92	1.33	11.44	7	337		
	FS	27,219	1,741,683	36,269	64	1.33	17.48	23	1,193	17,133	151
	NPS	842	43,491	765	52	.91	7.13	2	55	24,621	586
Total		37,466	2,646,894	49,525	71	1.32	$15.73	32	1,585	41,754	737

*CPS

TABLE 2

SUMMARY OF RIBES ERADICATION BY LAND OWNERSHIP - 1944

Land Ownership	First Working			Second and Other Workings				All Workings		
	Acres	Average Per Acre		Acres	Average Per Acre		Acres Second Working Only	Acres	Average Per Acre	
		Ribes	Man-Days		Ribes	Man-Days			Ribes	Man-Days
National Forests	6,772	109	1.14	17,281	49	1.51	8,645	24,053	66	1.40
National Parks				842	52	.91	162	842	52	.91
Subtotal Federal	6,772	109	1.14	18,123	49	1.48	8,807	24,895	65	1.38
State and Private	3,786	124	1.04	8,785	62	1.26	4,222	12,571	81	1.18
Grand Total	10,558	115	1.10	26,908	53	1.41	13,029	37,466	71	1.32
NATIONAL FORESTS										
Clearwater	784	68	1.78	1,367	47	1.35	214	2,151	55	1.53
St. Joe	128	145	3.66	2,857	29	2.48	455	2,985	33	2.58
Coeur d'Alene	662	41	.79	2,887	48	1.88	1,352	3,549	46	1.68
Kaniksu	2,187	136	.86	9,398	52	1.03	5,891	11,585	68	1.00
Cabinet	729	102	1.33	772	97	2.49	733	1,501	99	1.93
Kootenai	2,282	118	1.08					2,282	118	1.08
Total	6,772	109	1.14	17,281	49	1.51	8,645	24,053	66	1.40
NATIONAL PARKS										
Mt. Rainier				636	15	.88		636	15	.88
Glacier				206	165	.99	162	206	165	.99
Total				842	52	.91	162	842	52	.91
STATE AND PRIVATE LANDS										
Idaho	2,113	220	1.79	8,102	60	1.19	3,716	10,215	93	1.32
Montana	1,673	4	.09	529	97	2.46	352	2,202	27	.66
Washington				154	57	.97	154	154	57	.97
Total	3,786	124	1.04	8,785	62	1.26	4,222	12,571	81	1.18

TABLE 3

SUMMARY OF EXPENDITURES - FEDERAL AND COOPERATIVE - 1944

State	Total Federal Funds	Total Cooperative Funds (Direct and Indirect)	Grand Total All Funds	Federal Funds			
				Bureau of Entomology and Plant Quarantine		Forest Service	Park Service
				Leadership and Coord. (3101)	Cooperative Ribes Erad. (3103)		
Idaho	$492,651.51	$29,119.58	$521,771.09	$77,043.75	$79,477.33	$336,130.43	
Montana	79,463.73	1,800.00	81,263.73	7,368.47		71,735.78	$ 359.48
Washington	85,768.59	1,000.00	86,768.59	6,203.96		68,020.80	11,543.83
Wyoming	857.15	200.00	1,057.15	857.15			
Total	$658,740.98	$32,119.58	$690,860.56	$91,473.33	$79,477.33	$475,887.01	$11,903.31

State	Cooperative Funds			
	Direct Aid			Indirect Aid
	State	Private	Total	
Idaho	$13,506.60	$15,612.98	$29,119.58	
Montana				$1,800.00
Washington				1,000.00
Wyoming				200.00
Total	$13,506.60	$15,612.98	$29,119.58	$3,000.00

TABLE IA

STATUS OF RIBES ERADICATION BY STATES AND OPERATING AGENCIES - 1918-1944 (INCLUSIVE)
(Net Figures Used)

State	White Pine in Control Area Acres	Control Area (W.P.& Prot. Zones) Acres	Initially Worked Acres	Percent Initially Worked	Initially Unworked Acres	Maintenance Acres	Percent on Maintenance	Second Working Acres	Third and Other Workings Acres
Idaho	2,249,119	2,249,119	1,514,756	67	734,363	528,034	23	357,927	60,680
Montana	213,353	213,353	132,363	62	80,990	74,008	35	11,837	3,878
Washington	152,964	152,964	107,937	71	45,027	46,988	31	31,700	14,766
Subtotal	2,615,436	2,615,436	1,755,056	67	860,380	649,030	25	401,464	79,324
Colorado	206,000*	206,000	14,859	7	191,141	8,000	4	1,962	
Wyoming	251,700*	251,700	21,760	9	229,940	9,000	4		
Subtotal	457,700*	457,700	36,619	8	421,081	17,000	4	1,962	
Total	3,073,136	3,073,136	1,791,675	58	1,281,461	666,030	22	403,426	79,324

*Indefinite

STATUS OF RIBES ERADICATION BY LAND OWNERSHIP - 1918-1944 (INCLUSIVE)

Land Ownership	White Pine in Control Area Acres	Control Area (W.P.& Prot. Zones) Acres	Initially Worked Acres	Percent Initially Worked	Initially Unworked Acres	Maintenance Acres	Percent on Maintenance	Second Working Acres	Third and Other Workings Acres
National Forests R-1	1,392,369	1,392,369	1,038,204	75	354,165	381,845	27	232,312	37,242
National Forests R-2	394,000*	394,000	36,619	9	357,381	17,000	4	1,962	
National Forests R-4	27,000*	27,000			27,000				
Subtotal	1,813,369	1,813,369	1,074,823	59	738,546	398,845	22	234,274	37,242
National Parks	39,281	39,281	6,778	17	32,503	5,080	13	4,519	5,530
Indian Reservations	11,000*	11,000			11,000				
Public Domain	29,409	29,409	16,717	57	12,692	5,812	20	5,900	1,039
Total Interior Lands	79,690	79,690	23,495	29	56,195	10,892	14	10,419	6,569
Total All Federal Lands	1,893,059	1,893,059	1,098,318	58	794,741	409,737	22	244,693	43,811
State and Private Lands	1,180,077	1,180,077	693,357	59	486,720	256,293	22	158,733	35,513
Total All Lands	3,073,136	3,073,136	1,791,675	58	1,281,461	666,030	22	403,426	79,324

*Indefinite

TABLE 2A

SUMMARY OF RIBES ERADICATION BY LAND OWNERSHIP - 1918-1944 (INCLUSIVE)
(Net Figures Used)

Land Ownership	First Working			Second and Other Workings			All Workings		
	Acres	Average Per Acre		Acres	Average Per Acre		Acres	Average Per Acre	
		Ribes	Man-Days		Ribes	Man-Days		Ribes	Man-Days
National Forests R-1	1,038,204	208	.90	269,554	116	1.16	1,307,758	189	.96
National Forests R-2	36,619	41	.36	1,962	44	.34	38,581	41	.36
National Parks	6,778	219	1.28	10,049	50	.88	16,827	118	1.04
Public Domain	16,717	166	.66	6,939	126	1.18	23,656	154	.81
Total Federal Lands	1,098,318	202	.88	288,504	113	1.14	1,386,822	183	.94
State and Private Lands	693,357	174	.68	194,246	142	1.00	887,603	167	.75
Total	1,791,675	191	.80	482,750	125	1.09	2,274,425	177	.86
NATIONAL FORESTS									
Clearwater	150,270	259	.84	54,207	138	1.03	204,477	227	.89
St. Joe	215,376	322	1.04	91,719	113	1.29	307,095	260	1.11
Coeur d'Alene	305,363	184	1.12	54,356	125	1.37	359,719	175	1.16
Kaniksu	257,086	146	.66	58,312	90	.85	315,398	135	.70
Cabinet	61,542	170	.81	9,795	117	1.32	71,337	164	.88
Kootenai	48,567	72	.55	1,165	93	.95	49,732	72	.56
Subtotal Region 1	1,038,204	208	.90	269,554	116	1.16	1,307,758	189	.96
Region 2	36,619	41	.36	1,962	44	.34	38,581	41	.36
Total	1,074,823	202	.89	271,516	115	1.15	1,346,339	185	.94
NATIONAL PARKS									
Mount Rainier	3,581	284	1.32	9,026	34	.85	12,607	105	.99
Glacier	3,197	145	1.22	1,023	187	1.14	4,220	156	1.20
Total	6,778	219	1.28	10,049	50	.88	16,827	118	1.04
STATE AND PRIVATE LANDS									
Idaho	651,247	170	.66	174,851	132	.98	826,098	163	.73
Montana	19,017	131	.71	3,732	135	1.53	22,749	132	.84
Washington	23,093	332	1.10	15,663	224	1.10	38,756	290	1.10
Total	693,357	174	.68	194,246	142	1.00	887,603	167	.75

TABLE 3A

SUMMARY OF RIBES ERADICATION BY STATES, OPERATING AGENCIES AND WORKINGS 1918-1944 (INCLUSIVE)
(Gross Figures Used)

State	Operating Agency	First Working			Second Working		
		Acres	Ribes Destroyed	Man-Days	Acres	Ribes Destroyed	Man-Days
Idaho	BEPQ	780,048	129,949,114	517,897	144,581	21,208,853	136,541
	Forest Service	884,923	198,051,822	839,536	216,693	26,405,717	247,014
	Subtotal	1,664,971	328,000,936	1,357,433	361,274	47,614,570	383,555
Montana	BEPQ	65,469	5,913,038	30,728	1,961	565,047	2,577
	Forest Service	67,697	11,089,853	62,448	9,125	989,462	13,344
	Park Service	3,197	464,555	3,905	979	167,950	1,051
	Subtotal	136,363	17,467,446	97,081	12,065	1,722,459	16,972
Washington	BEPQ	48,156	14,422,701	46,892	11,920	2,634,166	12,212
	Forest Service	69,359	12,898,479	49,487	18,407	2,117,807	14,270
	Park Service	8,254	1,640,507	10,070	4,327	400,913	5,941
	Subtotal	125,769	28,961,687	106,449	34,654	5,152,886	32,423
Colorado	BEPQ	14,859	410,649	6,292	1,962	86,886	664
Wyoming	BEPQ	21,760	1,085,771	6,940			
All States	BEPQ	930,292	151,781,273	608,749	160,424	24,494,952	151,994
	Forest Service	1,021,979	222,040,154	951,471	244,225	29,512,986	274,628
	Park Service	11,451	2,105,062	13,975	5,306	568,863	6,992
Total		1,963,722	375,926,489	1,574,195	409,955	54,576,801	433,614

State	Operating Agency	Third and Other Workings			All Workings				
		Acres	Ribes Destroyed	Man-Days	Acres	Ribes Destroyed	Man-Days	Average Per Acre	
								Ribes	Man-Days
Idaho	BEPQ	23,138	2,428,808	26,716	947,767	153,586,775	681,154	162	.72
	Forest Service	38,149	3,283,842	56,537	1,139,765	227,741,381	1,143,087	200	1.00
	Subtotal	61,287	5,712,650	83,253	2,087,532	381,328,156	1,824,241	183	.87
Montana	BEPQ	648	59,040	777	68,078	6,537,125	34,082	96	.50
	Forest Service	3,186	182,153	3,348	80,008	12,261,468	79,140	153	.99
	Park Service	44	23,718	116	4,220	656,223	5,072	156	1.20
	Subtotal	3,878	264,911	4,241	152,306	19,454,816	118,294	128	.78
Washington	BEPQ	4,681	768,915	4,036	64,757	17,825,782	63,140	275	.98
	Forest Service	4,599	304,124	3,796	92,365	15,320,410	67,553	166	.73
	Park Service	5,706	154,777	4,840	18,287	2,196,197	20,851	120	1.14
	Subtotal	14,986	1,227,816	12,672	175,409	35,342,389	151,544	201	.86
Colorado	BEPQ				16,821	497,535	6,956	30	.41
Wyoming	BEPQ				21,760	1,085,771	6,940	50	.32
All States	BEPQ	28,467	3,256,763	31,529	1,119,183	179,532,988	792,272	160	.71
	Forest Service	45,934	3,770,119	63,681	1,312,138	255,323,259	1,289,780	195	.98
	Park Service	5,750	178,495	4,956	22,507	2,852,420	25,923	127	1.15
Total		80,151	7,205,377	100,166	2,453,828	437,708,667	2,107,975	178	.86

TABLE 4A

SUMMARY OF ALL OTHER CONTROL WORK BY STATES AND OPERATING AGENCIES 1918-1944 (INCLUSIVE)
(Gross Figures Used)

State	Operating Agency	Cultivated Black Currants Destroyed	Treatment Infected Pines		Nursery Sanitation					
			Pines Treated	Man-Days	Nurseries Worked	Acres Worked	Ribes Destroyed	Man-Days	Number of Nurseries	
									Retaining Protective Zones	Dropping Protective Zones
Idaho	BEPQ	16,553	1,746,393	4,307						
	Forest Service		27,905	187						
	Subtotal	16,553	1,774,298	4,494						
Montana	BEPQ	5,080			1 *	6,486	1,265,602	6,513	1	
	Forest Service		67,208	1,189	(1)*	2,905	271,121	1,406	(1)	
	Subtotal	5,080	67,208	1,189	1	9,391	1,536,723	7,919	1	
Washington	BEPQ	78,226	126,372	221	1	378	20,275	640		1
	Forest Service		133,300	224						
	Park Service		36,432	1,075						
	Subtotal	78,226	296,104	1,520	1	378	20,275	640		1
Wyoming	BEPQ				1	2,038	73,786	567	1	
All States	BEPQ	99,859	1,872,765	4,528	3	8,902	1,359,663	7,720	2	
	Forest Service		228,413	1,600	(1)	2,905	271,121	1,406	(1)	
	Park Service		36,432	1,075						
Total		99,859	2,137,610	7,203	3	11,807	1,630,784	9,126	2	1

*Savenac Nursery

TABLE 5A

SUMMARY OF ALL RIBES ERADICATION BY STATES, OPERATING AGENCIES AND PROGRAMS 1918-1944 (INCLUSIVE)
(Gross Figures Used)

State	Operating Agency	Regular and Cooperative			All Emergency Programs			Totals		
		Acres	Ribes	Man-Days	Acres	Ribes	Man-Days	Acres	Ribes	Man
Idaho	BEPQ	248,855	25,777,104	127,462	698,912	127,809,671	553,692	947,767	153,586,775	68
	Forest Service	395,452	78,310,468	414,746	744,313	149,430,913	728,341	1,139,765	227,741,381	1,14
	Subtotal	644,307	104,087,572	542,208	1,443,225	277,240,584	1,282,033	2,087,532	381,328,156	1,82
Montana	BEPQ	2,002	761,710	3,295	66,076	5,775,415	30,787	68,078	6,537,125	3
	Forest Service	29,821	3,421,736	31,080	50,187	8,839,732	48,060	80,008	12,261,468	7
	Park Service	993	159,761	1,064	3,227	496,462	4,008	4,220	656,223	
	Subtotal	32,816	4,343,207	35,439	119,490	15,111,609	82,855	152,306	19,454,816	11
Washington	BEPQ				64,757	17,825,782	63,140	64,757	17,825,782	6
	Forest Service	33,671	7,819,917	28,462	58,694	7,500,493	39,091	92,365	15,320,410	6
	Park Service	7,327	903,030	8,159	10,960	1,293,167	12,692	18,287	2,196,197	2
	Subtotal	40,998	8,722,947	36,621	134,411	26,619,442	114,923	175,409	35,342,389	15
Colorado	BEPQ				16,821	497,535	6,956	16,821	497,535	
Wyoming	BEPQ				21,760	1,085,771	6,940	21,760	1,085,771	
All States	BEPQ	250,857	26,538,814	130,757	868,326	152,994,174	661,515	1,119,183	179,532,988	79
	Forest Service	458,944	89,552,121	474,288	853,194	165,771,138	815,492	1,312,138	255,323,259	1,28
	Park Service	8,320	1,062,791	9,223	14,187	1,789,629	16,700	22,507	2,852,420	2
Total		718,121	117,153,726	614,268	1,735,707	320,554,941	1,493,707	2,453,828	437,708,667	2,10

TABLE 6A

SUMMARY OF ALL EXPENDITURES 1918-1944 (INCLUSIVE)
(Gross Figures Used)

State	Total Federal Funds		Total Cooperative Funds	Grand Total All Funds	Regular Funds		
	Regular	Emergency			Bureau (B. P. I. & E. P. Q.)	Forest Service	Park Service
Idaho	$5,283,733.17	$6,270,021.33	$552,103.11	$12,105,857.61	$1,670,143.14	$3,613,590.03	
Montana	566,071.00	594,772.92	113,300.00	1,274,143.92	227,118.34	328,747.42	$10,205.24
Washington	582,812.93	755,582.95	80,000.00	1,418,395.88	238,788.47	278,088.56	65,935.90
Subtotal	6,432,617.10	7,620,377.20	745,403.11	14,798,397.41	2,136,049.95	4,220,426.01	76,141.14
Colorado	11,852.04	67,437.96	11,700.00	90,990.00	11,852.04		
Wyoming	12,171.43	65,391.37	4,900.00	82,462.80	12,171.43		
Subtotal	24,023.47	132,829.33	16,600.00	173,452.80	24,023.47		
Total	$6,456,640.57	$7,753,206.53	$762,003.11	$14,971,850.21	$2,160,073.42	$4,220,426.01	$76,141.14

State	Cooperative Funds			
	Direct Aid			Indirect Aid
	State	Private	Total	
Idaho	$190,209.64	$135,582.47	$325,792.11	$226,311.00
Montana				113,300.00
Washington				80,000.00
Subtotal	190,209.64	135,582.47	325,792.11	419,611.00
Colorado				11,700.00
Wyoming				4,900.00
Subtotal				16,600.00
Total	$190,209.64	$135,582.47	$325,792.11	$436,211.00

Cooperative Blister Rust Control on State and Private Lands (Work Project BLR-3-4)

Cooperative ribes eradication in 1944 on state and privately-owned lands under the provision of the Lea Act was again confined to the state of Idaho. State and private funds contributed for this work were deposited with the United States Treasurer and used in conjunction with federal funds administered by the Bureau of Entomology and Plant Quarantine. Work under this project was confined to lands within the Clearwater, Potlatch and Priest Lake Timber Protective Associations.

The field project included 7 camps with a total of 337 workers, who were largely teen-age boys, 16 and 17 years old. The camps and workers were distributed as follows: Clearwater 3 camps, 106 workers; Potlatch 2 camps, 130 workers; Priest Lake 2 camps, 101 workers.

The results of the 1944 program and the net progress on state and private lands are presented in the following tabulations:

1. Expenditures - Calendar Year 1944

Association	State and Private	Federal (BLR-3-4)	Total
Clearwater	$11,017.17	$26,003.64	$37,020.81
Potlatch	8,555.16	29,670.88	38,226.04
Priest Lake	8,547.25	23,802.81	32,350.06
Total	$28,119.58*	$79,477.33	$107,596.91

*State $12,506.60, private $15,612.98.
Cash expenditures from cooperative funds deposited with U. S. Treasury, 1928-1944; State $187,211.64, Private $135,580.47, Total $322,792.11.

2. Cooperative Ribes Eradication in Idaho, 1944

	Acres Worked					Per Acre	
Association	Initial	Rework	Total	Man-Days	Ribes Destroyed	Man-Days	Ribes
Clearwater	576	2,738	3,314	4,616	439,830	1.39	133
Potlatch	633	2,890	3,523	4,256	138,136	1.21	39
Priest Lake	322	2,246	2,568	3,619	283,754	1.41	110
Total	1,531	7,874	9,405	12,491	861,720	1.33	92

3. Cooperative Ribes Eradication in Idaho, 1928-1944

Association	Acres Worked Initial	Rework	Total	Man-Days	Ribes Destroyed	Per Acre Man-Days	Ribes
Clearwater	24,581	16,245	40,826	34,022	5,508,754	.83	135
Potlatch	18,691	14,909	33,600	27,806	4,588,241	.83	137
Priest Lake	111,741	13,704	125,445	45,166	10,637,809	.36	85
Total	155,013	44,858	199,871	106,994	20,734,804	.54	104

4. State and Private Lands Worked in 1944

State	Acres Worked First	Second	Third	Total
Idaho	2,113	3,716	4,386	10,215
Montana	1,673	352	177	2,202
Washington		154		154
Total	3,786	4,222	4,563	12,571

5. Progress on State and Private Lands, 1923-1944 (Net Acres)

State	Acres Worked First	Second	Third	Acres Unworked	Total Acres
Idaho	651,247	145,570	29,281	465,048	1,116,295
Montana	19,017	2,181	1,551	16,345	35,362
Washington	23,093	10,982	4,681	5,327	28,420
Total	693,357	158,733	35,513	486,720	1,180,077

The status of blister rust control on state and private lands has not changed materially from conditions described in previous reports. The work project has not been of sufficient size in recent years to perform all the work that is urgent with the result that pine infection is becoming very severe in many areas. The amount of cutover area is increasing and the protection of the new white pine coming in on these areas is one of the major problems at the present time.

A significant change in the private and state land acreage in the blister rust control area in the state of Washington was caused by the transfer of approximately 30,000 acres from private to federal ownership. Most of this acreage involved the Northern Pacific holdings on the Kaniksu National Forest which were acquired by the Forest Service. Ribes eradication had been performed on 21,867 acres. There remain only 35,362 acres of state and privately owned land in the white pine control area in Washington which is about evenly

divided between the Kaniksu and Mount Spokane operations. No work has been performed on the latter operation since the termination of WPA project work in 1941.

There are 1,180,077 acres of state and privately-owned lands in the white pine control area of which 693,357 acres have been initially worked, 158,733 acres worked twice and 35,513 acres worked three times. Twenty-two percent of the control area amounting to 256,293 acres is classed on a maintenance basis.

Blister Rust Control on National Forests
(Financial Project BLR-4)

Blister rust control was conducted by the Forest Service in Region One on six national forests. Available labor was not sufficient to build up the project on all forests to the desired strength. Boys, 16 and 17 years of age, were the main source of labor. German internees, 155 in number, employed on the Kaniksu were the most stable labor. Of three crews of Mexican Nationals secured in midseason and assigned to the St. Joe, Kaniksu and Clearwater, only the crew on the St. Joe was satisfactory, the other two being almost immediately transferred to other work.

The number of camps and approximate number of workers on each forest project were as follows:

National Forest	Number of Camps	Number of Workers
Clearwater	3	136
St. Joe	5	270
Coeur d'Alene	4	221
Kaniksu	8	368
Cabinet	2	122
Kootenai	1	76
Total	23	1,193

The need for Forest Service blister rust crews for fighting forest fires was much greater than in previous years and resulted in a serious loss of time from ribes eradication work. This loss is particularly important because of the short period the boys are available. Other factors, including favorable weather conditions, less labor turnover, and the long period over which the German internees were available, contributed to a more productive season than 1943 to the extent of 1,479 more acres worked and securing 2,936 more effective man-days.

Forest Service crews in 1944 worked 27,219 acres of which 9,027 acres were first working, 9,363 acres second working and 8,829 acres third working.

The present work status on national forest lands in Region One is as follows: first working 1,038,204 acres; second working 232,312 acres; third working 37,242 acres; and 354,165 acres are unworked. There are 1,392,369 acres in the control area with 381,845 acres, amounting to 27 percent, on a maintenance basis.

There is no material change in the blister rust situation on national forest lands from that described in the 1943 report. In the general approach to handling the blister rust problem, increased attention is being given to the incorporation of methods unfavorable to ribes germination and survival into timber management practices. In cutting methods and in treatment of areas following logging, two elements, shade and fire, may be employed to minimize

the ribes problem. In this connection, the Bureau of Entomology and Plant Quarantine has carried on control investigations and is initiating additional studies.

Two important field conferences and inspections were made to consider these problems. The first of these was on the Lick Creek timber sale area near Avery, Idaho. Several representatives of the Forest Service, Bureau of Entomology and Plant Quarantine, and Potlatch Forests, Inc., spent three days on this area considering marking and cutting methods in various sites and type conditions. A second field inspection of cutting practices and conditions on cutover lands was made on the Kaniksu and Coeur d'Alene Forests by E. E. Carter and A. G. Lindh of the Forest Service, accompanied by members of the Bureau of Entomology and Plant Quarantine and the forest supervisor on each forest and members of his staff. These field inspections served to direct attention to possible changes in cutting practices which will reduce the blister rust factor.

The following tabulations present the expenditures and accomplishments of the Forest Service program and the present work status on National Forest lands:

1. Allotments to U. S. Forest Service Region One

Fiscal year 1944	$550,000.00
Fiscal year 1945	722,100.00

2. Expenditures - Calendar Year 1944

Clearwater	$ 61,316.38
St. Joe	116,657.36
Coeur d'Alene	85,656.69
Kaniksu	140,520.80
Cabinet	45,235.78
Kootenai	26,500.00
Total	$475,887.01

3. Expenditures, 1930-1944

	Regular	Emergency*	Total
Clearwater	$ 820,485.57	$ 413,454.80	$1,233,940.37
St. Joe	1,647,053.55	383,340.06	2,030,393.61
Coeur d'Alene	759,846.19	669,809.81	1,429,656.00
Kaniksu	664,293.28	458,055.36	1,122,348.64
Cabinet	263,171.28	258,476.52	521,647.80
Kootenai	65,576.14	28,233.00	93,809.14
Total	$4,220,426.01	$2,211,369.55	$6,431,795.56

*ERA(WPA) $558,006.65; NIRA(PWA) $1,653,362.90

4. Ribes Eradication by Forest Service Crews, 1944

Forest	Acres Worked			Man-Days	Ribes Destroyed	Per Acre	
	Initial	Rework	Total			Man-Days	Ribes
Clearwater	794	1,395	2,189	3,583	146,903	1.64	67
St. Joe	78	2,497	2,575	7,111	87,298	2.76	34
Coeur d'Alene	662	2,887	3,549	5,965	164,667	1.68	46
Kaniksu	2,809	10,112	12,921	12,797	865,576	.99	67
Cabinet	2,358	1,301	3,659	4,294	202,366	1.17	55
Kootenai	2,326		2,326	2,519	274,873	1.08	118
Total	9,027	18,192	27,219	36,269	1,741,683	1.33	64

5. Ribes Eradication by Forest Service Crews, 1930-1944

Forest	Acres Worked			Man-Days	Ribes Destroyed	Per Acre	
	Initial	Rework	Total			Man-Days	Ribes
Clearwater	188,683	51,228	239,911	215,587	54,913,381	.90	229
St. Joe	261,138	108,810	369,948	413,690	94,353,697	1.12	255
Coeur d'Alene	275,532	58,435	333,967	391,557	57,715,661	1.17	173
Kaniksu	228,929	59,375	288,304	189,806	36,079,052	.66	125
Cabinet	45,542	11,040	56,582	61,938	10,206,233	1.09	180
Kootenai	22,155	1,271	23,426	17,202	2,055,235	.73	88
Total	1,021,979	290,159	1,312,138	1,289,780	255,323,259	.98	195

6. Ribes Eradication on National Forest Lands, 1923-1944

Forest	Net Acres Worked			Acres Unworked	Total Acres
	First	Second	Third		
Clearwater	150,270	49,274	4,933	50,082	200,352
St. Joe	215,376	76,916	14,803	96,832	312,208
Coeur d'Alene*	305,363	45,827	8,529	50,138	355,501
Kaniksu	257,086	51,618	6,694	99,271	356,357
Cabinet	61,542	7,512	2,283	12,052	73,594
Kootenai	48,567	1,165		45,790	94,357
Total	1,038,204	232,312	37,242	354,165	1,392,369

*Includes national forest land on Mount Spokane operation.
Region 2. First working 36,619 acres; second working 1,962 acres.

Blister Rust Control on National Parks
(Financial Project BLR-5)

Blister rust control operations were carried on by the National Park Service in 1944 on Mount Rainier and Glacier National Parks. Also, a scouting project was conducted by the Bureau of Entomology and Plant Quarantine, under the leadership of M. C. Riley, to determine any spread of the rust into Yellowstone or Grand Teton National Parks.

Mount Rainier. A crew of 40 boys performed ribes eradication and canker elimination work in 1944. Third working was performed on 636 acres which supported an average of 15 ribes per acre. Approximately half of the effective time was spent on canker elimination in which 24,621 trees were treated requiring 586 man-days. The net control has been reduced to 3,581 acres comprising the Longmire-Silver Forest unit and the White River unit. This entire acreage has received at least two workings and approximately 2,600 acres are on a maintenance basis.

Glacier. A crew of 15 Civilian Public Service employees was engaged on ribes eradication for a short period in 1944, covering 206 acres, all of which represented second and third working. Ribes averaged 165 per acre. Initial ribes eradication has been performed on 3,197 acres and rework on 1,023 acres. While 10,000 acres have been listed as a tentative control area, the National Park Service has selected areas comprising only 3,197 acres, all of which have received initial treatment for protection from blister rust. Other areas are being considered but no decision has been made as to their inclusion in the control area. Blister rust infection was found for the first time on limber pine in the Two Medicine Lake area. Five cankers, probably of 1937 origin, were found. The only other pine infection on control areas in the park is that previously reported on the Lake MacDonald area. It is known that infection occurs in varying amounts on western white pine in areas not included in the control area.

Scouting for Blister Rust in Yellowstone and Grand Teton National Parks. In September 1944, a crew of four men inspected ribes and white pines in and adjacent to Yellowstone and Grand Teton National Parks, in order to ascertain any spread or development of the rust in this territory. Infection had been found on Ribes petiolare in 1937 on Bear Creek in the Gallatin National Forest approximately 19 miles from the northwest corner of Yellowstone National Park but scouting in 1941 had failed to reveal any extension of the disease.

In Yellowstone National Park attention was centered on those areas where control work has been contemplated or on areas where heavy concentrations of R. petiolare were known to occur. Good scouting samples were secured on the following areas: Mt. Washburn, Carnelian Creek, Gibbon River, Firehole Lake, Midway Geyser Basin, Craig Pass, Sylvan Pass, Glenn Creek, Lava Creek and Geode Creek. The only white pine blister rust found was on about 20 leaves from two R. petiolare bushes on Clematis Gulch in the Mammoth area.

In Grand Teton National Park scouting was conducted on R. petiolare on Cascade Creek and on R. petiolare and R. viscosissimum on the west side of Jenny Lake. No white pine blister rust was found.

Adjacent to Yellowstone National Park scouting was done on Tom Miner and Mol Heron Greeks in the Absaroka National Forest with negative results. On Bear Creek in the Gallatin National Forest infection was prevalent on R. petiolare.

In both cases where infected ribes were located, the associated white pine were examined but no pine infection was discovered. In connection with this scouting work pinon pine rust (Cronartium occidentale) specimens were found on the Mammoth, Mol Heron, Tom Miner and Jenny Lake areas. All specimen determinations were made by the Division of Forest Pathology.

This is the first time white pine blister rust has been found in Yellowstone National Park and means that the limber pine stand at Mammoth is definitely threatened.

Summary of blister rust control work on National Parks.

1. Allotments and Expenditures by National Park Service

National Park	Allotments Fiscal Year 1945	Expenditures Calendar Year 1944	Expenditures All Years
Mount Rainier	$19,600.00	$11,543.83	$65,935.90
Glacier	500.00	359.48	10,205.24
Total	$20,100.00	$11,903.31	$76,141.14

2. Ribes Eradication on National Parks, 1944

National Park	Acres Worked Second	Third	Total	Man-Days	Ribes Destroyed	Per Acre Man-Days	Per Acre Ribes
Mount Rainier		636	636	561	9,515	.88	15
Glacier	162	44	206	204	33,976	.99	165
Total	162	680	842	765	43,491	.91	52

3. Gross Acreage Worked on National Parks, 1930-1944

National Park	Acres Worked First	Second	Third and Other	Total	Man-Days	Ribes Destroyed	Per Acre Man-Days	Per Acre Ribes
Mount Rainier	8,254	4,327	5,706	18,287	20,851	2,196,197	1.14	120
Glacier	3,197	979	44	4,220	5,072	656,223	1.20	156
Total	11,451	5,306	5,750	22,507	25,923	2,852,420	1.15	127

4. Work Status in Net Control Area

National Park	Acres Worked First	Second	Third and Other	Acres Unworked	Total Acres Control Area
Mount Rainier	3,581	3,540	5,486		3,581
Glacier	3,197	979	44	6,803	10,000
Yellowstone				12,900	12,900
Grand Teton				5,800	5,800
Rocky Mountain				7,000	7,000
Total	6,778	4,519	5,530	32,503	39,281

BLISTER RUST CONTROL, INLAND EMPIRE, 1944

By
Frank O. Walters
Assistant Regional Leader

The white pine lands of Northern Idaho, Eastern Washington and Western Montana are considered as the Inland Empire portion of the Northwestern Region. The following operations represent the various control units:

1. Clearwater Operation
2. St. Joe Operation
3. Coeur d'Alene Operation
4. Kaniksu Operation
5. Montana Operation (Kootenai and Cabinet Forests)
6. Mount Spokane Operation (No work since 1941)

German war internees, Mexican Nationals and boys of high school age constituted the Forest Service eradication crews. The teen-age workers comprised the bulk of these crews and were recruited from all parts of the United States. The Bureau of Entomology and Plant Quarantine used principally high school boys. Fifty-one percent were recruited from Idaho, twenty percent from the Spokane area, twenty percent from the Midwest and nine percent from parts of the West other than Idaho and the Spokane area. Experience gained during the past two seasons by the supervisory personnel was used to good advantage. The boys were more intelligently handled and better trained, thus better results were obtained and less labor turnover resulted.

German internees were used on ribes eradication work on the Kaniksu operation with good results. An extension of the use of this type of labor to other operations would be a distinct advantage. Mexican National laborers were tried on three operations but worked out satisfactorily only on the St. Joe Forest. It is felt that by making proper advance preparations, creating a better understanding of this type of labor and by instituting an adequate indoctrination and training program for both Mexicans and the supervisory personnel satisfactory work can be accomplished.

Supervisory and other technical positions were difficult to fill. In the case of two operations it was necessary to train high school instructors without previous woods experience and place them in charge of camps. It was necessary to train some of the more outstanding high school boys for checkers and work them under the close supervision of the checker foreman. Individuals capable of acting as assistants or straw bosses were very hard to find. Cooks were scarce and several of those secured were unsatisfactory. Due to these difficulties it was necessary to operate large camps which tend to be inefficient and difficult to manage. In the smaller camps the foremen can give the individual attention so needed in the younger age groups.

Fire was a major factor in interfering with this year's eradication program. All operations lost from one to four weeks. Two operations were unable to

resume effective work after August 1. Generally the camps are just reaching the peak of productive capacity at this time; consequently loss of time in August is most severe.

Practically all work was second and third eradication and was applied to plantations, areas of reproduction and cutover, representing young stands of great potential value. The normal abundance of ribes on these lands, the vast acreages involved, the delays in eradication schedules, the wide-spread presence of the rust, and the susceptibility of young trees to damage are factors which combine to create a highly critical condition in these young age classes. It is obvious that a high degree of efficiency is needed to effect control on such lands. In spite of handicaps, a higher degree of efficiency was attained this year. There was an increased acreage worked; 36,624 acres were covered this year as against 35,934 acres last year. There was a slight decrease in the effective per man-day output; this can be attributed to interference from fire.

A high percent of the lands to which ribes eradication measures were applied received a current check thus contributing to the increased efficiency of the work. Most of the operations were able to carry on some pine disease survey work as an aid in gauging the status of the rust in certain areas. There is great need for an expansion of the pine disease and post check surveys.

The control program continues far behind the necessary rework schedule. The accumulation of thousands of acres in urgent need of rework and the increasing logged over acreage create a complex problem in determining the priority of areas to be worked under the limited war time program. The classification work carried on during the past two seasons has contributed materially in determining the status of the control areas. Factors considered in classifying areas were their status relative to feasibility of control and their pine-producing capacity. Areas of mature timber which had been worked and have subsequently been logged are now classified as unworked cutover type. Areas not considered as warranting additional expenditures are dropped from the control area even though eradication measures had been applied.

In order to present a more complete picture of actual progress, gross acres and net acres are used in the report tables. Gross acres are the total acres worked in each type including those logged or dropped from the control area. Net acres are the actual amounts of worked and unworked acreages still remaining in each type in the control area. Net acreages are now presented by amounts of each type worked or unworked in the control area.

TABLE 1

EXPENDITURES BY APPROPRIATIONS IN INLAND EMPIRE, 1944

Cooperating Agency	Appropriation	Amount
Bureau of Entomology and Plant Quarantine	Regular BLR-1-4	$ 47,750.88
	Regular BLR-3-4	79,477.33
	Subtotal	$127,228.21
State of Idaho Timber Protective Associations	State BLR-3-4	12,506.60
	Private BLR-3-4	15,612.98
	Subtotal	$ 28,119.58
Forest Service	Regular BLR-4	$475,887.01
Total		$631,234.80

TABLE 2

CLASSIFIED EXPENDITURES IN INLAND EMPIRE, 1944

Item	Bureau of Entomology and Plant Quarantine				Forest Service	Total
	Regular BLR-1-4	Regular BLR-3-4	State and Private BLR-3-4	Total	Regular BLR-4	
Sal.perm.men	$31,347.82	$ -	$ -	$ 31,347.82	$ 21,990.44	$ 53,338.26
Sal.temp.men	4,732.91	15,168.98	374.53	20,276.42	37,952.30	58,228.72
Wages,temp.labs.	5,307.02	59,040.69	16,047.87	80,395.58	292,589.38	372,984.96
Subs.sup.	1,116.32	5,088.12	11,628.30	17,832.74	86,540.97	104,373.71
Equipment	360.04	-	-	360.04	21,865.31	22,225.35
Travel&Trans.	2,603.41	70.32	-	2,673.73	6,365.69	9,039.42
Other Sup.	2,283.36	109.22	68.88	2,461.46	8,582.92	11,044.38
Total	$47,750.88	$79,477.33	$28,119.58	$155,347.79	$475,887.01	$631,234.80

TABLE 3

SUMMARY OF RIBES ERADICATION, 1944
INLAND EMPIRE

Working	Eradication Type	Year of Origin	Acres Worked	Man-Days	Ribes Destroyed	Per Acre Man-Days	Per Acre Ribes
First	Cutover	1940-44	1,111	1,294	259,055	1.16	233
	Burn	1940-44	210	184	47,333	.88	225
	Plantation	1940-44	365	195	42,426	.53	116
	Cutover	1920-39	2,113	2,951	301,423	1.40	143
	Reproduction	1910-39	1,501	3,204	203,480	2.13	136
	Pole		3,798	1,683	86,208	.44	23
	Mature		942	909	120,166	.96	128
	Miscellaneous		282	5	95	.02	1
	Stream (1)		236	1,232	150,551	5.22	638
	Total		10,558	11,657	1,210,737	1.10	115
Second	Plantation	1940-44	60	194	15,587	3.23	260
	Cutover	1920-39	786	1,349	53,164	1.72	68
	Reproduction	1910-39	6,475	8,924	293,564	1.38	45
	Pole		2,448	2,261	88,174	.92	36
	Mature		572	474	22,122	.83	39
	Miscellaneous		33	34	1,503	1.03	46
	Stream		2,493	4,258	277,902	1.71	111
	Total		12,867	17,494	752,016	1.36	58
Third	Plantation	1940-44	236	548	25,096	2.32	106
	Cutover	1920-39	4,213	5,131	317,119	1.22	75
	Reproduction	1910-39	7,314	11,097	160,931	1.52	22
	Pole		214	89	2,425	.42	11
	Mature		260	328	54,790	1.26	211
	Stream (3)		962	2,416	80,289	2.51	83
	Total		13,199	19,609	640,650	1.49	49
All Workings	Cutover	1940-44	1,111	1,294	259,055	1.16	233
	Burn	1940-44	210	184	47,333	.88	225
	Plantation	1940-44	661	937	83,109	1.42	126
	Cutover	1920-39	7,112	9,431	671,706	1.33	94
	Reproduction	1910-39	15,290	23,225	657,975	1.52	43
	Pole		6,460	4,033	176,807	.62	27
	Mature		1,774	1,711	197,078	.96	111
	Miscellaneous		315	39	1,598	.12	5
	Stream (4)		3,691	7,906	508,742	2.14	138
	Total		36,624	48,760	2,603,403	1.33	71

Chemical work included above:

	Acres	Man-Days	Gallons Spray
(1)	11	24	294
(3)	211	442	8,251
(4)	222	466	8,545

442 932 17390

TABLE 4

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1944
INLAND EMPIRE

State	Working	Class	Acres	Effective Man-Days	Ribes	Gallons Spray	Per Acre Man-Days	Basis Ribes
Idaho	First	EQ-Coop.	1,531	3,440	417,441		2.25	273
		FS-Reg.	3,586	3,781	263,841	294	1.05	74
		Total	5,117	7,221	681,282	294	1.41	133
	Second	EQ-Coop.	3,504	4,088	123,951		1.17	35
		FS-Reg.	5,725	7,759	320,541		1.36	56
		Total	9,229	11,847	444,492		1.28	48
	Third	EQ-Coop.	4,370	4,963	320,328	6,600	1.14	73
		FS-Reg.	5,726	11,727	191,700	1,651	2.05	33
		Total	10,096	16,690	512,028	8,251	1.65	51
	All Workings	EQ-Coop.	9,405	12,491	861,720	6,600	1.33	92
		FS-Reg.	15,037	23,267	776,082	1,945	1.55	52
		Total	24,442	35,758	1,637,802	8,545	1.46	67
Washington	First	FS-Reg.	757	849	178,714		1.12	236
	Second	FS-Reg.	2,553	2,834	202,624		1.11	79
	Third	FS-Reg.	2,887	2,506	107,024		.87	37
	All Workings	FS-Reg.	6,197	6,189	488,362		1.00	79
Montana	First	FS-Reg.	4,684	3,587	350,741		.77	75
	Second	FS-Reg.	1,085	2,813	104,900		2.59	97
	Third	FS-Reg.	216	413	21,598		1.91	100
	All Workings	FS-Reg.	5,985	6,813	477,239		1.14	80
Total	First	EQ-Coop.	1,531	3,440	417,441		2.25	273
		FS-Reg.	9,027	8,217	793,296	294	.91	88
		Total	10,558	11,657	1,210,737	294	1.10	115
	Second	EQ-Coop.	3,504	4,088	123,951		1.17	35
		FS-Reg.	9,363	13,406	628,065		1.43	67
		Total	12,867	17,494	752,016		1.36	58
	Third	EQ-Coop.	4,370	4,963	320,328	6,600	1.14	73
		FS-Reg.	8,829	14,646	320,322	1,651	1.66	36
		Total	13,199	19,609	640,650	8,251	1.49	49
	All Workings	EQ-Coop.	9,405	12,491	861,720	6,600	1.33	92
		FS-Reg.	27,219	36,269	1,741,683	1,945	1.33	64
		Total	36,624	48,760	2,603,403	8,545	1.33	71

TABLE 5

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1944
INLAND EMPIRE

State	Working	Number of Acres Worked												
		By Forest Service				By Bureau of Entomology and Plant Quarantine				Total				
										Federal	Other			
		National Forest	State	Private	Total	National Forest	State	Private	Total	National Forest	State	Private	Total	Total
Idaho	First	2,954		632	3,586	50	1,008	473	1,531	3,004	1,008	1,105	2,113	5,117
	Second	5,069	168	488	5,725	444	2,594	466	3,504	5,513	2,762	954	3,716	9,229
	Third	5,630		96	5,726	80	2,342	1,948	4,370	5,710	2,342	2,044	4,386	10,096
	Total	13,653	168	1,216	15,037	574	5,944	2,887	9,405	14,227	6,112	4,103	10,215	24,442
Washington	First	757			757					757				757
	Second	2,399		154	2,553					2,399		154	154	2,553
	Third	2,887			2,887					2,887				2,887
	Total	6,043		154	6,197					6,043		154	154	6,197
Montana	First	3,011		1,673	4,684					3,011		1,673	1,673	4,684
	Second	733		352	1,085					733		352	352	1,085
	Third	39		177	216					39		177	177	216
	Total	3,783		2,202	5,985					3,783		2,202	2,202	5,985
Total	First	6,722		2,305	9,027	50	1,008	473	1,531	6,772	1,008	2,778	3,786	10,558
	Second	8,201	168	994	9,363	444	2,594	466	3,504	8,645	2,762	1,460	4,222	12,867
	Third	8,556		273	8,829	80	2,342	1,948	4,370	8,636	2,342	2,221	4,563	13,199
	Total	23,479	168	3,572	27,219	574	5,944	2,887	9,405	24,053	6,112	6,459	12,571	36,624

TABLE 6

TOTAL RIBES BY SPECIES ERADICATED, 1944
INLAND EMPIRE

Working	Eradication Type	Acres	Ribes by Species						Total Ribes
			Ribes lacustre	Ribes viscosissimum	Ribes petiolare	Ribes inerme	Ribes irriguum	Ribes coloradense	
First	Cutover (1940-44)	1,111	37,902	219,537	1,616				259,055
	Burn (1940-44)	210	18,015	29,318					47,333
	Plantation (1940-44)	365	1,725	40,701					42,426
	Cutover (1920-39)	2,113	36,900	261,475		2,951	97		301,423
	Reproduction (1910-39)	1,501	121,311	69,807		12,299		63	203,480
	Pole	3,798	73,653	9,702		2,551		302	86,209
	Mature	942	118,347	1,819					120,166
	Miscellaneous	282	95						95
	Stream	236	125,175	1,614	882	21,680		1,200	150,551
	All Types	10,558	533,123	633,975	2,498	39,481	97	1,565	1,210,737
Second	Plantation (1940-44)	60	6,747	8,840					15,587
	Cutover (1920-39)	786	32,393	20,671		100			53,164
	Reproduction (1910-39)	6,475	207,508	72,755	9,599	3,702			293,564
	Pole	2,448	34,339	52,886	949				88,174
	Mature	572	15,879	6,036		207			22,122
	Miscellaneous	33	877	626					1,503
	Stream	2,493	164,235	23,581		90,086			277,902
	All Types	12,867	461,978	185,395	10,548	94,095			752,016
Third	Plantation (1940-44)	236	21,819	3,277					25,096
	Cutover (1920-39)	4,213	139,619	177,428	72				317,119
	Reproduction (1910-39)	7,314	103,224	54,721	2,165	804	17		160,931
	Pole	214	1,759	6		660			2,425
	Mature	260	8,874	45,916					54,790
	Stream	962	26,602	320	27,137	26,222	8		80,289
	All types	13,199	301,897	281,668	29,374	27,686	25		640,650
All Workings	Cutover (1940-44)	1,111	37,902	219,537	1,616				259,055
	Burn (1940-44)	210	18,015	29,318					47,333
	Plantation (1940-44)	661	30,291	52,818					83,109
	Cutover (1920-39)	7,112	208,912	459,574	72	3,051	97		671,706
	Reproduction (1910-39)	15,290	432,043	197,283	11,764	16,805	17	63	657,975
	Pole	6,460	109,751	62,594	949	3,211		302	176,807
	Mature	1,774	143,100	53,771		207			197,078
	Miscellaneous	315	972	626					1,598
	Stream	3,691	316,012	25,515	28,019	137,988	8	1,200	508,742
	All Types	36,624	1,296,998	1,101,036	42,420	161,262	122	1,565	2,603,403

TABLE 7

SUMMARY OF RIBES ERADICATION, 1923-1944
INLAND EMPIRE

Working	Eradication Type	Year of Origin	Gross Acres Worked	Man-Days	Ribes Destroyed	Per Acre		Net Acreage Remaining	
						Man-Days	Ribes	Worked	Unworked
First	Cutover	1940-44	4,192	4,785	1,155,357	1.14	276	4,192	108,468
	Burn	1940-44	926	535	100,985	.58	109	926	246
	Plantation	1940-44	5,687	7,972	2,149,010	1.40	378	5,687	432
	Cutover	1920-39	78,634	76,187	24,564,142	.97	312	65,819	248,647
	Reproduction	1910-39	598,592	666,272	181,125,507	1.11	303	588,847	166,847
	Pole		360,373	152,786	27,879,986	.42	77	357,121	92,894
	Mature		707,431	298,323	63,236,654	.42	89	569,118	200,885
	Miscellaneous		36,236	30,911	7,849,273	.85	217	33,967	10,616
	Stream (1)		123,581	309,217	64,264,093	2.50	520	122,601	24,542
	Total		1,915,652	1,546,988	372,325,007	.81	194	1,748,278	853,577
Second	Plantation	1940-44	1,168	1,608	171,547	1.38	147	1,168	-
	Cutover	1920-39	51,838	57,128	12,641,106	1.10	244	51,838	-
	Reproduction	1910-39	169,267	203,326	21,023,579	1.20	124	167,626	-
	Pole		79,632	47,098	4,359,668	.59	55	79,632	-
	Mature		41,927	26,257	2,931,629	.63	70	38,217	-
	Miscellaneous		3,995	4,972	875,793	1.24	219	3,995	-
	Stream (2)		54,860	85,569	11,917,730	1.56	217	54,469	-
	Total		402,687	425,958	53,921,052	1.06	134	396,945	-
Third	Plantation	1940-44	513	919	51,175	1.79	100	513	-
	Cutover	1920-39	14,907	18,334	1,387,566	1.23	93	14,907	-
	Reproduction	1910-39	34,265	47,125	2,671,240	1.38	78	33,658	-
	Pole		7,326	4,803	360,926	.66	49	7,326	-
	Mature		2,175	1,850	210,596	.85	97	2,175	-
	Miscellaneous		560	339	27,446	.61	49	560	-
	Stream (3)		14,655	21,840	2,317,933	1.49	158	14,655	-
	Total		74,401	95,210	7,026,882	1.28	94	73,794	-
All Workings	Cutover	1940-44	4,192	4,785	1,155,357	1.14	276	4,192	108,468
	Burn	1940-44	926	535	100,985	.58	109	926	246
	Plantation	1940-44	7,368	10,499	2,371,732	1.42	322	7,368	432
	Cutover	1920-39	145,379	151,649	38,592,814	1.04	252	132,564	248,647
	Reproduction	1910-39	802,124	916,723	204,820,326	1.14	255	790,131	166,847
	Pole		447,331	204,687	32,600,580	.46	73	444,079	92,894
	Mature		751,533	326,430	66,378,879	.43	88	609,510	200,885
	Miscellaneous		40,791	36,222	8,752,512	.89	215	38,522	10,616
	Stream (4)		193,096	416,626	78,499,756	2.16	407	191,725	24,542
	Total		2,392,740	2,068,156	433,272,941	.86	181	2,219,017	853,577

Chemical work included above:

	Acres	Man-Days	Gallons Spray
(1)	23,135	54,819	1,522,015
(2)	9,298	13,252	242,794
(3)	1,785	1,934	38,375
(4)	34,218	70,005	1,803,184

TABLE 8

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1923-1944
INLAND EMPIRE

State	Class	Gross Acres	Effective Man-Days	Total Ribes	Gallons Spray	Per Acre Basis	
						Man-Days	Ribes
Idaho	EQ-Reg.	48,984	20,468	5,042,300	79,864	.42	103
	EQ-Coop.	199,871	106,994	20,734,804	195,707	.54	104
	EQ-Emerg.	514,942	404,100	96,874,569	213,935	.78	188
	FS-Reg.	395,452	414,746	78,310,468	458,368	1.05	198
	FS-Emerg.	337,869	216,240	56,636,775	125,491	.64	168
	CCC	590,414	661,693	123,729,240	657,303	1.12	210
	Total	2,087,532	1,824,241	381,328,156	1,730,668	.87	183
Washington	EQ-Emerg.	64,757	63,140	17,825,782		.98	275
	FS-Reg.	33,671	28,462	7,819,917		.85	232
	FS-Emerg.	36,366	14,366	4,013,260		.40	110
	CCC	22,328	24,705	3,487,233		1.11	156
	Total	157,122	130,693	33,146,192		.83	211
Montana	EQ-Reg.	2,002	3,295	761,710	34,795	1.65	380
	EQ-Emerg.	66,076	30,787	5,775,415	1,330	.47	87
	FS-Reg.	29,821	31,080	3,421,736	8,428	1.04	115
	FS-Emerg.	35,712	35,620	7,367,723	21,638	1.00	206
	CCC	14,475	12,440	1,472,009	6,325	.86	102
	Total	148,066	113,222	18,798,593	72,516	.76	127
Idaho Washington Montana	EQ-Reg.	50,986	23,763	5,804,010	114,659	.47	114
	EQ-Coop.	199,871	106,994	20,734,804	195,707	.54	104
	EQ-Emerg.	645,775	498,027	120,475,766	215,265	.77	187
	FS-Reg.	458,944	474,288	89,552,121	466,796	1.03	195
	FS-Emerg.	409,947	266,246	68,017,758	147,129	.65	166
	CCC	627,217	698,838	128,688,482	663,628	1.11	205
	Total	2,392,740	2,068,156	433,272,941	1,803,184	.86	181

TABLE 9

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1923-1944
INLAND EMPIRE

State	Working	Net Acres Worked in Control Area						
		Federal			Other			
		National Forest	Public Domain	Total	State	Private	Total	Total
Idaho	First	847,147	16,362	863,509	233,092	418,155	651,247	1,514,756
	Second	206,517	5,840	212,357	50,585	94,985	145,570	357,927
	Third	30,360	1,039	31,399	10,595	18,686	29,281	60,680
	Total	1,084,024	23,241	1,107,265	294,272	531,826	826,098	1,933,363
Washington	First	80,948	315	81,263	6,832	16,261	23,093	104,356
	Second	17,118	60	17,178	3,935	7,047	10,982	28,160
	Third	4,599		4,599	2,114	2,567	4,681	9,280
	Total	102,665	375	103,040	12,881	25,875	38,756	141,796
Montana	First	110,109	40	110,149	734	18,283	19,017	129,166
	Second	8,677		8,677	1	2,180	2,181	10,858
	Third	2,283		2,283		1,551	1,551	3,834
	Total	121,069	40	121,109	735	22,014	22,749	143,858
Total	First	1,038,204	16,717	1,054,921	240,658	452,699	693,357	1,748,278
	Second	232,312	5,900	238,212	54,521	104,212	158,733	396,945
	Third	37,242	1,039	38,281	12,709	22,804	35,513	73,794
	Total	1,307,758	23,656	1,331,414	307,888	579,715	887,603	2,219,017

TABLE 10

PROGRESS OF FIRST WORKING BY OWNERSHIP CLASSES, 1923-1944
INLAND EMPIRE

State	Ownership Class	Net Acres in Control Area		
		Worked	Unworked	Total
Idaho	National Forest	847,147	256,623	1,103,770
	Public Domain	16,362	12,692	29,054
	Subtotal Federal	863,509	269,315	1,132,824
	State	233,092	115,135	348,227
	Private	418,155	349,913	768,068
	Subtotal Other	651,247	465,048	1,116,295
	Total	1,514,756	734,363	2,249,119
Washington	National Forest	80,948	39,700	120,648
	Public Domain	315		315
	Subtotal Federal	81,263	39,700	120,963
	State	6,832	988	7,820
	Private	16,261	4,339	20,600
	Subtotal Other	23,093	5,327	28,420
	Total	104,356	45,027	149,383
Montana	National Forest	110,109	57,842	167,951
	Public Domain	40		40
	Subtotal Federal	110,149	57,842	167,991
	State	734	173	907
	Private	18,283	16,172	34,455
	Subtotal Other	19,017	16,345	35,362
	Total	129,166	74,187	203,353
Total	National Forest	1,038,204	354,165	1,392,369
	Public Domain	16,717	12,692	29,409
	Subtotal Federal	1,054,921	366,857	1,421,778
	State	240,658	116,296	356,954
	Private	452,699	370,424	823,123
	Subtotal Other	693,357	486,720	1,180,077
	Total	1,748,278	853,577	2,601,855

TABLE 11

TOTAL RIBES BY SPECIES ERADICATED, 1923-1944
INLAND EMPIRE

Working	Eradication Type	Gross Acres	Ribes by Species								Total Ribes
			Ribes lacustre	Ribes viscosissimum	Ribes petiolare	Ribes inerme	Ribes irriguum	Ribes coloradense	Ribes triste	Ribes acerifolium	
First	Cutover (1940-44)	4,192	137,188	1,004,921	13,248						1,155,357
	Burn (1940-44)	926	65,034	35,951							100,985
	Plantation (1940-44)	5,587	588,281	1,560,121	161		447				2,149,010
	Cutover (1920-39)	78,634	8,045,900	16,300,967	81,190	95,981	40,104				24,564,142
	Reproduction (1910-39)	598,592	50,491,389	123,704,886	205,598	1,213,321	505,650	3,518	1,145		181,125,507
	Pole	360,373	14,237,153	12,950,938	65,233	388,519	233,465	302	462	3,914	27,879,986
	Mature	707,431	42,466,027	19,658,542	224,608	403,562	474,605	7,257	26	2,027	63,236,554
	Miscellaneous	36,236	2,543,563	5,143,144	19,825	113,585	29,056				7,849,273
	Stream	123,581	42,577,230	2,008,959	6,395,849	13,091,891	116,220	33,105	21,255	19,584	64,264,093
	All Types	1,915,652	161,151,865	187,368,429	7,005,712	15,306,859	1,399,547	44,182	22,888	25,525	372,325,007
Second	Plantation (1940-44)	1,168	101,581	69,966							171,547
	Cutover (1920-39)	51,838	3,586,225	8,945,458	57,608	30,441	21,374				12,641,106
	Reproduction (1910-39)	169,267	7,490,505	13,331,349	59,208	115,476	24,450		2,591		21,023,579
	Pole	79,632	2,156,296	2,134,947	26,757	39,928	1,740				4,359,669
	Mature	41,927	1,483,056	1,381,074	15,768	15,305	36,159		267		2,931,629
	Miscellaneous	3,995	255,405	614,066	5,447	875					875,793
	Stream	54,860	6,907,823	806,197	2,412,008	1,603,531	32,190		155,981		11,917,730
	All Types	402,587	21,980,891	27,283,057	2,576,796	1,805,556	115,913		158,839		53,921,052
Third	Plantation (1940-44)	513	46,607	4,568							51,175
	Cutover (1920-39)	14,907	531,211	834,918	16,293	5,001	143				1,387,566
	Reproduction (1910-39)	34,265	1,107,643	1,541,276	10,513	11,363	231		114		2,671,240
	Pole	7,326	180,524	179,425	42	929	6				360,926
	Mature	2,175	122,967	85,893	8		1,728				210,596
	Miscellaneous	560	8,659	18,763		24					27,446
	Stream	14,655	1,141,751	32,016	605,966	520,068	8		18,124		2,317,933
	All Types	74,401	3,139,362	2,696,859	632,922	537,385	2,116		18,238		7,026,882
All Workings	Cutover (1940-44)	4,192	137,188	1,004,921	13,248						1,155,357
	Burn (1940-44)	926	65,034	35,951							100,985
	Plantation (1940-44)	7,368	736,469	1,634,655	161		447				2,371,732
	Cutover (1920-39)	145,379	12,163,336	26,081,343	155,091	131,423	61,621				38,592,814
	Reproduction (1910-39)	802,124	59,089,537	143,577,511	275,419	1,340,160	530,331	3,518	3,850		204,820,326
	Pole	447,331	16,573,973	15,265,310	92,032	429,376	235,211	302	462	3,914	32,500,580
	Mature	751,533	44,072,050	21,125,509	240,384	418,867	512,492	7,257	293	2,027	66,378,879
	Miscellaneous	40,791	2,807,727	5,775,973	25,272	114,484	29,056				8,752,512
	Stream	193,096	50,626,804	2,847,172	9,413,823	15,215,490	148,418	33,105	195,360	19,584	78,499,756
	All Types	2,392,740	186,272,118	217,348,345	10,215,430	17,649,800	1,517,576	44,182	199,965	25,525	433,272,941

BLISTER RUST CONTROL WORK, CLEARWATER OPERATION, 1944

By
H. J. Faulkner, Operation Supervisor
Byron C. Amsbaugh, Forest Officer

INTRODUCTION

The blister rust control program on the Clearwater Operation during the 1944 field season consisted of six camps of 30 to 60 men each. Three of the camps were financed by regular Forest Service appropriations and three by cooperative funds administered by the Bureau of Entomology and Plant Quarantine. The Forest Service camps performed work on the Clearwater National Forest and the Bureau camps on state and private lands on the Clearwater Timber Protective Association which is adjacent to the National Forest.

Early season plans called for approximately the same size program as 1943 but due to a shortage of workers the 1944 program was approximately 25 percent less than 1943 and the smallest since 1929.

As in the past two seasons the crews were made up entirely of boys 17 years old and younger with only a small percent experienced in blister rust control work. Past experience in training and working teen-age boys has resulted in significant improvement in the quality and quantity of work and a reduction in the high rate of turnover which is common to this age class of worker.

ORGANIZATION AND ADMINISTRATION

Previous cooperative working agreements between the various agencies interested in control of white pine blister rust continued to guide the organization and administration of field work. Work on Forest Service lands was set up and administered as a special project under the direction of a project leader with technical assistance furnished by Bureau personnel. Bureau personnel administered and directed all work performed by cooperative camps.

The blister rust control field organization was as follows:

Bureau of Entomology and Plant Quarantine

Harry J. Faulkner, Operation Supervisor
John C. Gonyou, Checker Foreman

U. S. Forest Service

Byron C. Amsbaugh, Forest Officer

Program	Number Camps	Number Workers	Number Checkers
EQ-Cooperative	3	105	1
FS-Regular	3	135	1

Total number employed on blister rust control 242

Field headquarters were established near Pierce, Idaho, at the old Reed's ranch CCC camp, on April 17. This camp has been used as a headquarters for all blister rust control work on the operation for the past 8 seasons. It also serves as an operating and supply base for Bureau camps and the past 3 seasons as a work camp for a 25-man crew. A temporary headquarters was established at the Pierce Ranger Station as an operating base for Forest Service camps. Forest Service camps are supplied from the central Forest Service warehouse at the Pierce Ranger Station.

The first work camp was established on May 15 and all camps were operating by June 10. The first camp was closed on August 20 and all camps were closed by September 1.

LOCATION AND DESCRIPTION OF AREAS

The camps were located as follows:

Forest Service

Drainage	Township	Range	Section	Work Performed in Sections
Beaver Creek	39 N.	5 E.	14	14,15,26,27,33,34
Washington Creek	39 N.	6 E.	36	25,26,35,36
Independence Creek	40 N.	11 E.	29	19,20,28,29
*Sylvan Creek	37 N.	7 E.	27	27,28,33,34

Bureau of Entomology and Plant Quarantine

Cow Creek	37 N.	4 E.	15	15,16,20,21,22
Scofield Creek	39 N.	6 E.	33	29,28,32,33,34
Orofino Creek	36 N.	5 E.	10	13,14

*Beaver Creek camp moved to Sylvan Creek late in season.

The Beaver Creek camp performed second and third workings on plantations established from 1937 to 1940. The Beaver Creek 1937 plantings comprising the bulk of the area, supported a comparatively light population of small size ribes. However, it is a difficult area to work due to the heavy cover of brush and herbaceous vegetation. The Alder Creek plantation of approximately 60 acres was burned and planted in 1940 and the ribes are numerous and a few still germinating. Another working will be necessary in two years.

The Washington Creek camp performed both chemical and hand eradication in an advanced reproduction stand which became established after a 1914 burn and 1922 reburn. This was second ribes eradication in the upland and while ribes were fairly light, working conditions were difficult due to windfall, brush and the density of the reproduction. It will be necessary to recheck the stream in a few years. Some additional work may also be necessary in the upland.

The camp located on Independence Creek in the Moose City Basin area performed initial work in pole and advanced reproduction stands. Ribes were comparatively light and confined mostly to the stream type and stream zone. A small amount of chemical work was necessary on Main Independence Creek.

The Sylvan Creek camp which was the second location for the Beaver Creek camp worked for a short time in area planted in 1939 and 1940. The area received a heavy burn in 1931 and ribes population has stabilized. This was second working and the bulk of the ribes was removed on the first coverage of the area. Two camps will be required to complete the ribes eradication on this plantation next season.

The Bureau camp located on Cow Creek worked in a 10-year old reproduction stand on cutover land. Ribes have continued to germinate on this area over a longer period of time following the logging disturbance than is usual on cutover areas and although this was the third working numerous ribes were present over most of the area. Approximately one half of the area was extremely difficult working due to heavy windfall and dense brush. The remainder of the area supported a light to medium residual stand of pole timber and in this type ribes eradication was comparatively easy. Another working will be required on parts of the area.

The Scofield camp, located on Bush Creek which is a tributary of Scofield Creek, worked in the same area as the Washington Creek Forest Service Camp. Both camps were located in the Scofield burn and working conditions are quite comparable. Ribes petiolare was eradicated from approximately 100 acres of stream type in this camp area requiring 6,300 gallons of chemical.

The Bureau camp located in sec. 10, T. 36 N., R. 5 E., is the blister rust control headquarters camp near Pierce. This camp worked entirely on areas which have been logged since 1940, involving the eradication of large numbers of small ribes. Topography in this vicinity is gentle to rolling and working conditions are favorable due to the absence of a heavy brush cover which has not had time to become established since logging.

METHODS AND EQUIPMENT

Standardized methods were generally used with some variations made necessary by the lack of adequate and dependable supervision and workers with past experience. In the past it has been standard practice to rework all crew strips, where ribes were numerous, with one or two men several days following the first coverage of the strip. This year, due to a lack of sufficiently experienced and dependable boys who could work as individuals with a minimum of supervision, the rework men were placed directly behind the crew where they could be constantly supervised and checked by the straw boss. The latter method is more costly and less effective under most working conditions but expedient with the present labor and supervision.

No changes were made in standard equipment this year.

STATUS OF CONTROL

In general the status of control work on the Clearwater National Forest is favorable. Valuable reproduction and pole stands such as those on French, Tamarack, Lolo, Eldorado and Tumble Creek drainages became established prior to the large scale emergency programs of 1933 to 1936 and received initial and reworking during this period. The large block of advance pole in French, and Tamarack Creek drainages, approximately 12,000 acres, has very little infection as a result of the early eradication of Ribes petiolare from the stream type and working of the upland area. However, some additional work will be necessary in the stream type and on portions of the upland where the canopy has not closed sufficiently to suppress ribes growth. This is also true of the advanced pole stand on Eldorado Creek drainage. Disease surveys and post checks will be necessary in advanced reproduction and pole stands on Lolo, Musselshell, Tumble and Pine creeks, to determine where additional work is needed to place them on a maintenance basis.

The work load resulting from logging of mature stands is small at the present time but will increase considerably in the next few years. The cutover area in the Sourdough tributary of Beaver Creek does not offer much hope at present of again becoming a good white pine area. Only white pine was removed leaving a medium to dense canopy of other species which will prohibit the re-establishment of white pine over most of the area. The more recent logging on the Sheep Mountain Fork of Beaver Creek is an excellent seed tree cutting and will reproduce to white pine. Control work is planned in 1946.

The cutting in the Musselshell Creek drainage varies considerably in character. The recent seed tree and shelterwood cuttings in Johnson and Quartz draws offer good possibilities for reestablishing white pine and control work will be initiated at the proper time. The cutting on Deer Creek and south of the Musselshell Meadows will require hazard reduction and stand improvement before white pine can be established.

No expansion of the present worked area is planned for the Upper North Fork of the Clearwater River and Moose City Basin areas on the Kelly Creek district at the present time. The young stands of pine are generally stringers along streams with no large solid blocks. The rust is general throughout the area and ribes eradication costs are high. The value of these young stands will depend largely on the future management of the adjacent mature stands. The relative priority of this area in the blister rust control program is very indefinite because of the present inaccessibility of the area, the age and composition of the mature stands and the high costs for blister rust control.

An isolated block of 4,378 acres of reproduction near the Kelly Creek Ranger Station was dropped from the control area this year. The high cost of working and the heavy pine infection already present make it impracticable to attempt control on this area.

The status of control on state and private lands of the Clearwater Timber

Protective Association presents a different and much less favorable picture than on the National Forest. Cutting of the best white pine areas in state and private ownership has increased since the outbreak of the war and facilities for control work have steadily declined since the end of the large scale emergency programs. The present program is scarcely adequate for maintaining control on cutover lands worked during the larger programs. As a result many recently cutover areas which are coming back to white pine remain unworked and the rust is rapidly building up. However, an excellent seed source is being left on many of these areas which will allow the delay of working for several years. If facilities are available for working these areas within the next few years it may be possible to establish white pine reproduction although the presence of heavy infection will make the job more difficult and costly.

In general reproduction stands that are 10 years old and over are in good condition, although one or more workings will be required in most cases before protection is established. Due to minor disturbances caused by rodents, grazing and windthrow, a few ribes continue to germinate on most cutover areas for a period of 15 to 20 years following logging, although a high percent of stored seed germinates during the first 5 years. With the rust generally present in all young stands this creates a potentially dangerous situation which requires continuous checking to prevent serious damage.

A block of 17,622 acres of cutover area on Winter and Lower Orofino Creek drainages was dropped from the control area this year. This area lies along the western edge of the control area approaching the limits of the white pine type and the original stand was composed of a high percent of species other than pine. The removal of the white pine and cedar generally failed to open the canopy sufficiently for the reestablishment of white pine. No white pine seed source was left and a further opening of the stand would result in the establishment of fir and other species.

CHECKING AND PINE DISEASE SURVEY

One checker foreman and two checkers were used for checking worked areas. The two boys selected as checkers were very adept at finding ribes but lacked sufficient experience and training to organize and plan their work and interpret the significance of the data collected. However, the three worked very satisfactorily as a team with the foreman handling all planning, mapping and interpreting of data.

All worked areas were checked with the exception of 725 acres of advance pole in the Moose City Basin area.

The Upper Beaver Creek plantation area was given a careful check as it was planned to reduce the ribes population to a maintenance basis if possible. The results of the check showed that an average of 8 bushes and 13 feet of live stem still remained on the area including a few new seedlings. Portions of the area will require another working before permanent protection is established.

The small plantation on Alder Creek was reduced to 12 bushes and 16 feet of live stem per acre.

The average checking results for the Bureau and Forest Service camps which worked in the reproduction stand in the Scofield burn area were very similar. The check showed that 11 bushes and 27 feet of live stem were left on the upland area. It had been hoped that the ribes population on this area could be reduced to a considerably lower figure. However, due to the fact that the remaining ribes are scattered individual R. lacustre bushes, heavily screened by other brush and reproduction, another complete working may not be necessary. The stream type on the area will require a mop-up in a few years.

On first working of cutover 1940-44 the checking results showed that the objective of reducing the live stem by removal of the larger bushes had been accomplished. The average checks showed 23 bushes and 21 feet of live stem remaining per acre. The average for cutover 1920 to 1939 was 10 bushes and 17 feet of live stem per acre.

In addition to the regular check a post check was run on approximately 1,000 acres of recently cutover area.

A systematic disease survey was run on a 600 acre cutover area near Hollywood. The area was logged in 1934 with first working in 1939. Part of the area was given a second working in 1940 and 1941.

Results are as follows:

Miles of strip	3½
Number trees examined	1101
Number trees infected	154
Percent of infection	14
Percent infection since last eradication	3

A post check run at the same time showed 12 bushes and 18 feet of live stem per acre. It is planned to rework part of the area during 1945.

PROGRESS TABLES

The following tables, numbers 3 to 6 inclusive, present a summary of the work accomplished this year and tables 7 to 11 inclusive show the accumulative summary of all work since the beginning of control work on the operation in 1929. Several changes were made this year in reporting progress of ribes eradication in order to show more adequately the work status on the white pine control areas. A distinction has been made between gross acres, which represents the acreage worked in each type and net acres, which represents the acreage in each type which still remains in the control area.

Corrections were made for those areas reported in the past which were worked as mature prior to logging and subsequent workings in cutover type reported

as second and third workings. Corrections in gross acres worked in this category were as follows:

Cut over 1920-39 second working to first working	6,959 acres
Cut over 1920-39 third working to first working	865 acres
Cut over 1920-39 third working to second working	2,190 acres
Cut over 1940-44 second working to first working	1,416 acres

In the case of the acreage worked in mature stands which have been subsequently logged, the net worked acreage remaining in the mature type is reduced accordingly; when unworked mature stands are logged the net unworked acreage is likewise reduced. These areas become a cutover type and are shown in the net acreage column according to their work status in this type classification. Adjustments made for these areas in the net acres remaining in the control area were as follows:

Mature (first working) reduced 29,249 acres
Mature (second working) reduced 1,900 acres
Mature (unworked) reduced 8,090 acres
Cutover (unworked) increased 37,339 acres

In the re-examination of the white pine control areas, a total of 22,000 acres were classed as not sustaining satisfactory white pine possibilities to warrant the cost of protection and were dropped from the control area. These areas were as follows:

Cutover (unworked)	5,440 acres
Reproduction (unworked)	4,378 acres
Cutover (partially worked)	12,182 acres

TABLE 1

EXPENDITURES BY APPROPRIATIONS, CALENDAR YEAR 1944
CLEARWATER OPERATION

Cooperating Agency	Appropriation	Amount
Bureau of Entomology and Plant Quarantine	Regular BLR-1-4	$ 15,100.85
	Regular BLR-3-4	26,003.64
	Subtotal	$ 41,104.49
State of Idaho Clearwater Timber Protective Association	State BLR-3-4	4,622.67
	Private BLR-3-4	6,394.50
	Subtotal	$ 11,017.17
Forest Service	Regular BLR-4	$ 61,316.38
Total		$113,438.04

TABLE 2

CLASSIFIED EXPENDITURES, CALENDAR YEAR 1944
CLEARWATER OPERATION

Item	Bureau of Entomology and Plant Quarantine				Forest Service	
	Regular BLR-1-4	Regular BLR-3-4	State and Private BLR-3-4	Total	Regular BLR-4	Total
Sal. perm. men	$ 8,515.52			$ 8,515.52	$ 5,356.89	$ 13,872.41
Sal. temp. men	2,203.83	$ 4,666.89	$ 374.53	7,245.25	7,944.09	15,189.34
Wages, temp. labs.	2,498.55	18,410.48	8,017.00	28,926.03	28,631.48	57,557.51
Subs. supplies	674.57	2,835.94	2,619.69	6,130.20	13,172.89	19,303.09
Equipment	114.75			114.75	5,329.23	5,443.98
Travel & transp.	695.02	2.58		697.60	605.43	1,303.03
Other supplies	398.61	87.75	5.95	492.31	276.37	768.68
Total	$15,100.85	$26,003.64	$11,017.17	$52,121.66	$61,316.38	$113,438.04

TABLE 3

SUMMARY OF RIBES ERADICATION, 1944
CLEARWATER OPERATION

Working	Eradication Type	Year of Origin	Acres Worked	Man-Days	Ribes Destroyed	Per Acre	
						Man-Days	Ribes
First	Cutover	1940-44	505	913	225,184	1.81	446
	Cutover	1920-39	140	515	28,681	3.68	205
	Pole		714	999	42,757	1.40	60
	Stream (1)		11	24	882	2.18	80
	Total		1,370	2,451	297,504	1.79	217
Second	Plantation	1940-44	60	194	15,587	3.23	260
	Reproduction	1910-39	802	1,972	105,323	2.46	131
	Total		862	2,166	120,910	2.51	140
Third	Cutover	1920-39	2,017	1,979	115,544	.98	57
	Reproduction	1910-39	1,086	1,207	29,747	1.11	27
	Stream (3)		168	396	23,028	2.36	137
	Total		3,271	3,582	168,319	1.10	51
All Workings	Cutover	1940-44	505	913	225,184	1.81	446
	Plantation	1940-44	60	194	15,587	3.23	260
	Cutover	1920-39	2,157	2,494	144,225	1.16	67
	Reproduction	1910-39	1,888	3,179	135,070	1.68	72
	Pole		714	999	42,757	1.40	60
	Stream (4)		179	420	23,910	2.35	134
	Total		5,503	8,199	586,733	1.49	107

Chemical work included above:

	Acres	Man-Days	Gallons Spray
(1)	11	24	294
(3)	168	396	7,676
(4)	179	420	7,970

TABLE 4

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1944
CLEARWATER OPERATION

Working	Class	Acres	Effective Man-Days	Total Ribes	Gallons Spray	Per Acre Basis	
						Man-Days	Ribes
First	EQ-Coop.	576	1,034	243,560		1.80	423
	FS-Reg.	794	1,417	53,944	294	1.78	68
	Total	1,370	2,451	297,504	294	1.79	217
Second	EQ-Coop.	620	1,306	61,826		2.11	100
	FS-Reg.	242	860	59,084		3.55	244
	Total	862	2,166	120,910		2.51	140
Third	EQ-Coop.	2,118	2,276	134,444	6,300	1.07	63
	FS-Reg.	1,153	1,306	33,875	1,376	1.13	29
	Total	3,271	3,582	168,319	7,676	1.10	51
All Workings	EQ-Coop.	3,314	4,616	439,830	6,300	1.39	133
	FS-Reg.	2,189	3,583	146,903	1,670	1.64	67
	Total	5,503	8,199	586,733	7,970	1.49	107

TABLE 5

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1944
CLEARWATER OPERATION

State	Working	Number of Acres Worked											
		By Forest Service			By Bureau of Entomology and Plant Quarantine				Total				
									Federal	Other			
		National Forest	Private	Total	National Forest	State	Private	Total	National Forest	State	Private	Total	Total
Idaho	First	784	10	794		103	473	576	784	103	483	586	1,370
	Second	60	182	242	154		466	620	214		648	648	862
	Third	1,153		1,153		240	1,878	2,118	1,153	240	1,878	2,118	3,271
	Total	1,997	192	2,189	154	343	2,817	3,314	2,151	343	3,009	3,352	5,503

TABLE 6

TOTAL RIBES BY SPECIES ERADICATED, 1944
CLEARWATER OPERATION

Working	Eradication Type	Acres	Ribes by Species			Total Ribes
			Ribes lacustre	Ribes viscosissimum	Ribes petiolare	
First	Cutover (1940-44)	505	19,829	203,739	1,616	225,184
	Cutover (1920-39)	140	6,438	22,243		28,681
	Pole	714	42,756	1		42,757
	Stream	11			882	882
	All Types	1,370	69,023	225,983	2,498	297,504
Second	Plantation (1940-44)	60	6,747	8,840		15,587
	Reproduction (1910-39)	802	93,496	2,240	9,587	105,323
	All Types	862	100,243	11,080	9,587	120,910
Third	Cutover (1920-39)	2,017	12,199	103,273	72	115,544
	Reproduction (1910-39)	1,086	18,138	11,609		29,747
	Stream	168			23,028	23,028
	All Types	3,271	30,337	114,882	23,100	168,319
All Workings	Cutover (1940-44)	505	19,829	203,739	1,616	225,184
	Plantation (1940-44)	60	6,747	8,840		15,587
	Cutover (1920-39)	2,157	18,637	125,516	72	144,225
	Reproduction (1910-39)	1,888	111,634	13,849	9,587	135,070
	Pole	714	42,756	1		42,757
	Stream	179			23,910	23,910
	All Types	5,503	199,603	351,945	35,185	586,733

TABLE 7

SUMMARY OF RIBES ERADICATION, 1929-1944
CLEARWATER OPERATION

Working	Eradication Type	Year of Origin	Gross Acres Worked	Man-Days	Ribes Destroyed	Per Acre		Net Acreage Remaining	
						Man-Days	Ribes	Worked	Unworked
First	Cutover	1940-44	2,473	3,724	1,059,112	1.51	428	2,473	24,657
	Plantation	1940-44	60	232	134,749	3.87	2,246	60	0
	Cutover	1920-39	35,690	36,152	13,748,622	1.01	385	23,449	32,970
	Reproduction	1910-39	71,329	108,331	33,428,751	1.52	469	71,329	4,248
	Pole		29,925	17,137	3,828,386	.57	128	29,925	6,331
	Mature		219,289	99,880	23,422,354	.46	107	181,949	40,910
	Miscellaneous		5,852	3,900	1,700,804	.67	291	5,852	7,819
	Stream (1)		42,353	78,124	14,058,124	1.84	332	42,353	13,675
	Total		406,971	347,480	91,380,902	.85	225	357,390	130,610
Second	Plantation	1940-44	60	194	15,587	3.23	260	60	-
	Cutover	1920-39	29,220	28,441	7,844,529	.97	268	29,220	-
	Reproduction	1910-39	22,289	33,030	3,343,304	1.48	150	22,289	-
	Pole		13,995	7,892	1,110,792	.56	79	13,995	-
	Mature		16,067	7,801	811,832	.49	51	14,167	-
	Miscellaneous		511	573	371,107	1.12	726	511	-
	Stream (2)		23,780	26,966	3,329,143	1.13	140	23,780	-
	Total		105,922	104,897	16,826,294	.99	159	104,022	-
Third	Cutover	1920-39	9,837	10,968	867,167	1.11	88	9,837	-
	Reproduction	1910-39	3,410	4,205	276,770	1.23	81	3,410	-
	Stream (3)		2,588	2,755	296,174	1.06	114	2,588	-
	Total		15,835	17,928	1,440,111	1.13	91	15,835	-
All Workings	Cutover	1940-44	2,473	3,724	1,059,112	1.51	428	2,473	24,657
	Plantation	1940-44	120	426	150,336	3.55	1,253	120	0
	Cutover	1920-39	74,747	75,561	22,460,318	1.01	300	62,506	32,970
	Reproduction	1910-39	97,028	145,566	37,048,825	1.50	382	97,028	4,248
	Pole		43,920	25,029	4,939,178	.57	112	43,920	6,331
	Mature		235,356	107,681	24,234,186	.46	103	196,116	40,910
	Miscellaneous		6,363	4,473	2,071,911	.70	326	6,363	7,819
	Stream (4)		68,721	107,845	17,683,441	1.57	257	68,721	13,675
	Total		528,728	470,305	109,647,307	.89	207	477,247	130,610

Chemical work included above:

	Acres	Man-Days	Gallons Spray
(1)	15,027	31,179	794,484
(2)	5,875	8,142	119,985
(3)	705	942	15,012
(4)	21,607	40,263	929,481

TABLE 8

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1929-1944
CLEARWATER OPERATION

Class	Gross Acres	Effective Man-Days	Total Ribes	Gallons Spray	Per Acre Basis	
					Man-Days	Ribes
EQ-Reg.	4,412	5,273	1,129,228	79,864	1.20	256
EQ-Coop.	40,826	34,022	5,508,754	136,122	.83	135
EQ-Emerg.	133,970	125,277	30,398,093	136,847	.94	227
FS-Reg.	106,130	94,483	25,474,567	144,036	.89	240
FS-Emerg.	55,908	45,382	14,895,022	24,015	.81	266
CCC	187,482	165,868	32,241,643	408,597	.88	172
Total	528,728	470,305	109,647,307	929,481	.89	207

TABLE 9

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1929-1944
CLEARWATER OPERATION

Working	Net Acres Worked in Control Area						
	Federal			Other			Total
	National Forest	Public Domain	Total	State	Private	Total	
First	150,270	3,680	153,950	63,728	139,712	203,440	357,390
Second	49,274	628	49,902	13,762	40,358	54,120	104,022
Third	4,933	12	4,945	1,185	9,705	10,890	15,835
Total	204,477	4,320	208,797	78,675	189,775	268,450	477,247

TABLE 10

PROGRESS OF FIRST WORKING
BY OWNERSHIP CLASSES, 1929-1944
CLEARWATER OPERATION

Ownership Class	Net Acres in Control Area		
	Worked	Unworked	Total
National Forest	150,270	50,082	200,352
Public Domain	3,680	350	4,030
Subtotal Federal	153,950	50,432	204,382
State	63,728	26,530	90,258
Private	139,712	53,648	193,360
Subtotal Other	203,440	80,178	283,618
Total	357,390	130,610	488,000

TABLE 11

TOTAL RIBES BY SPECIES ERADICATED, 1929-1944
CLEARWATER OPERATION

Working	Eradication Type	Gross Acres	Ribes By Species						Total Ribes
			Ribes lacustre	Ribes viscosissimum	Ribes petiolare	Ribes inerme	Ribes irriguum	Ribes triste	
First	Cutover (1940-44)	2,473	81,210	964,654	13,248				1,059,112
	Plantation (1940-44)	60	32,168	102,581					134,749
	Cutover (1920-39)	35,690	2,317,710	11,318,472	72,860	28,370	11,210		13,748,622
	Reproduction (1910-39)	71,329	7,928,610	25,245,707	75,977	47,326	131,131		33,428,751
	Pole	29,925	2,510,390	1,278,821	31,617	6	7,090	462	3,828,386
	Mature	219,289	16,261,450	6,795,503	197,832	107,922	59,621	26	23,422,354
	Miscellaneous	5,852	338,812	1,329,756	17,838	114	14,284		1,700,804
	Stream	42,353	10,239,770	324,583	2,766,543	701,834	25,394		14,058,124
	All Types	406,971	39,710,120	47,360,077	3,175,915	885,572	248,730	488	91,380,902
Second	Plantation (1940-44)	60	6,747	8,840					15,587
	Cutover (1920-39)	29,220	1,039,469	6,737,035	55,843	106	12,076		7,844,529
	Reproduction (1910-39)	22,289	846,853	2,474,813	21,598	4	36		3,343,304
	Pole	13,995	545,661	548,785	16,095	1	250		1,110,792
	Mature	16,067	395,208	400,473	15,768	116		267	811,832
	Miscellaneous	511	19,861	345,799	5,447				371,107
	Stream	23,780	1,893,616	516,470	826,524	76,716	9,141	6,676	3,329,143
	All Types	105,922	4,747,415	11,032,215	941,275	76,943	21,503	6,943	16,826,294
Third	Cutover (1920-39)	9,837	150,633	700,098	16,293		143		867,167
	Reproduction (1910-39)	3,410	144,658	130,164	1,934		14		276,770
	Stream	2,588	188,778	2,573	82,007	22,816			296,174
	All Types	15,835	484,069	832,835	100,234	22,816	157		1,440,111
All Workings	Cutover (1940-44)	2,473	81,210	964,654	13,248				1,059,112
	Plantation (1940-44)	120	38,915	111,421					150,336
	Cutover (1920-39)	74,747	3,507,812	18,755,605	144,996	28,476	23,429		22,460,318
	Reproduction (1910-39)	97,028	8,920,121	27,850,684	99,509	47,330	131,181		37,048,825
	Pole	43,920	3,056,051	1,827,606	47,712	7	7,340	462	4,939,178
	Mature	235,356	16,656,658	7,195,976	213,600	108,038	59,621	293	24,234,186
	Miscellaneous	6,363	358,673	1,675,555	23,285	114	14,284		2,071,911
	Stream	68,721	12,322,164	843,626	3,675,074	801,366	34,535	6,676	17,683,441
	All Types	528,728	44,941,604	59,225,127	4,217,424	985,331	270,390	7,431	109,647,307

BLISTER RUST CONTROL WORK, ST. JOE OPERATION, 1944

By
F. J. Heinrich, Operation Supervisor
D. J. Moore, Pathologist, U. S. Forest Service
W. F. Painter, Assistant Operation Supervisor
F. A. Moore, Unit Supervisor, U. S. Forest Service

INTRODUCTION

White pine blister rust control program for the 1944 field season was carried on with two Bureau Cooperative and five Forest Service regular camps. A total acreage of 6,098 acres was covered by these seven camps. This program was far inadequate to meet the needs of work to be done.

Young white pine stands needing rework were given the highest priority in the season's work policy. In two cases small areas supporting excellent young pine adjacent to areas previously worked were given initial protection. Until an adequate control program is available the rust will continue to intensify on many areas. With intensification, control costs increase as more workings are required and a higher standard of efficiency is necessary.

ORGANIZATION AND ADMINISTRATION

Blister rust control on the St. Joe operation was organized as in the past in accordance with agreements between federal, state and private agencies and in accordance with provisions of the Appropriation Act. Personnel of the Bureau of Entomology and Plant Quarantine provided assistance in the over-all planning, coordination and technical direction of the program on lands of all ownership and administered the work of the two camps on state and private lands, The Forest Service administered the work of five camps on National Forest lands,

The blister rust control 1944 field organization was as follows:

Bureau of Entomology and Plant Quarantine	U. S. Forest Service
F. J. Heinrich, Operation Supervisor	D. J. Moore, Forest Officer
W. F. Painter, Assistant Operation Supervisor in charge of checking	F. A. Moore, Unit Supervisor

Program	Number Camps	Number Workers	Number Checkers
EQ-Cooperative	2	130	2
FS-Regular	5	270	3

Total number employed on blister rust control 400

Field headquarters at Clarkia, Idaho maintained by the Bureau was again used as an operating base for Bureau and some Forest Service activities. Warehousing and supplying of subsistence for all classes of camps were handled through the Clarkia Ranger Station warehousing facilities.

Workers for the Bureau camps were recruited through the State Forester's Office, Boise, Idaho, and the Blister Rust Control Office in Spokane, Washington. A sufficient number of employees was secured to fill the allotted number of camps. The Forest Service secured its workers locally, through forestry schools and by recruitment throughout the various regions. In spite of an intensive recruiting campaign it was not possible to hire enough men to fill camp quotas.

Boys 16 years of age accounted for 85 percent of the workers and 90 percent were inexperienced. A better understanding of the methods of handling the youthful worker resulted in fewer personnel problems this year. The work accomplishments were comparable to those of last year but below the normal standards. The greatest handicap was the length of time the workers were available. Thirty-six percent left the job in four weeks or less because of other employment, dissatisfaction with the work or homesickness. The remainder were on the job from one to slighly over two months. The short school vacations were a contributing factor to the abbreviated field season. Some schools did not let out until the middle of June while others reconvened shortly after August 15.

Thirty-seven Mexican Nationals were secured through the War Food Administration for blister rust control work in the Forest Service camps. These men averaged about 30 years of age and adapted themselves well to camp life and woods work. Their accomplishments were greater on areas supporting heavy ribes concentrations than on areas with few ribes. This can be attributed partially to their inexperience and training. Training was difficult since only one of the group understood and spoke the English language with any degree of fluency.

Forest Service crews spent considerable time on fire suppression. On the Sanders fire alone, which started September 6, all crews spent approximately ten days on fire fighting.

Cooperative camps on state and private land

1. Burnt Creek. Established May 16, closed August 19.

Area located in Burnt and Fisher Creek drainages in secs. 13, 23, 24, 25 and 26, T. 39 N., R. 2 E. and secs. 18 and 19, T. 39 N., R. 1 E. A total of 2,348 acres consisting of 501 acres of cutover and 1,847 acres of pole, 41-60 year age class, comprise the work unit. The total cutover acreage consisted of small areas which had been spot logged. Ribes eradication was difficult due to small ribes being intermingled with other vegetation and some additional cleanup work will be necessary within two years.

The area on Burnt Creek supports a thrifty and well-stocked stand of pole-sized white pine. Ribes were light and working conditions not difficult in all the pole stands. Infection is light on this area as a whole and protection in the pole stands has been established. The camp area was completed.

2. Purdue Creek Area. Camp established June 4, closed August 26.

Worked area located in secs. 6, 7, 8, 17 and 20, T. 41 N., R. 1 E. and the N. ½, sec. 13, T. 41 N., R. 1 W. The major portion of the work was in natural reproduction which lay in secs. 8, 17 and 20. Difficult working conditions due to windfalls, dead brush and density of the stand were encountered on 132 acres of first working in sec. 20. The young stand south of Purdue Creek was established in 1900 and the remainder in 1920. A 1938 white pine plantation located in secs. 6 and 7 was worked for the second time. The remaining area worked supported pine originating after 1928 and lay in the N. ½, sec. 13, T. 41 N., R. 1 W. and constituted third working.

The rust is heavy in the N. ½, sec. 20 and this area should be reworked and the adjacent protection zone extended in 1946. The infection on the remainder of the area is not serious and most of the area is protected.

Forest Service camps on federal land

1. Hidden Creek Area. Camp established May 10, closed September 1.

Area located on Hidden and Keeler Creek drainages secs. 21, 27, 28 and 34, T. 42 N., R. 1 E. and secs. 2 and 3, T. 41 N., R. 1 E. The 225 acres of upland worked were all reproduction type established in 1922 and worked for the third time. A total of 205 acres of stream type was worked on Hidden and Keeler Creeks. Due to the light stocking and general blister rust infection part of this area should be reworked in 1946.

Marble Creek Unit

The following areas designated as Cranberry, Toles and Bussel Creeks constitute a portion of the Marble Creek unit. This unit comprises 6,420 acres of thrifty well-stocked white pine reproduction which was established following a fire in 1922. Infection is general throughout the stand and some damage has taken place. However, this is not serious since some of the trees are producing seed and seedlings are being established.

2. Cranberry Creek Area. Camp established June 29, closed August 19.

Area located in sec. 25, T. 44 N., R. 2 E. and secs. 30 and 31, T. 44 N., R. 3 E. The portion worked consisted of 181 acres of reproduction and 15 acres of cutover. This was third working for all the area. Due to the density of the reproduction and the presence of windfalls difficult working conditions were encountered. One half of the area worked has been protected. The remainder will need some additional work in 1945.

3. Bussel Creek Area. Camp established May 18, closed August 31.

Work area lay in secs. 34 and 35, T. 44 N., R. 2 E. and secs. 2 and 3, T. 43 N., R. 2 E. This area is relatively free of brush but bordered by

heavier brush conditions on the higher slopes. There are several large alder patches on the area in T. 43 N., R. 2 E. All of the 683 acres covered was third working with the previous working being done in 1940. Working conditions were not difficult. A satisfactory ribes eradication job was accomplished with over 75 percent of worked area being protected. Infection is present throughout the area but no serious damage has resulted.

4. Toles Creek Area. Camp established May 22, closed August 15.

All work areas were located in secs. 23, 25 and 26, T. 44 N., R. 2 E. The upland work consisted of 361 acres third working and 75 acres second working. Scattered Ribes petiolare within the stream type were sprayed with chemical. Infection is generally distributed throughout the area and some additional work must be done in 1945 before protection is established.

5. Lucky Swede Creek Area. Camp established June 5, closed September 25.

All areas worked lay in sec. 1, T. 46 N., R. 5 E.; secs. 6 and 9, T. 46 N., R. 6 E.; sec. 31, T. 47 N., R. 6 E.; secs. 26, 34 and 35, T. 47 N., R. 5 E. This is part of the North Fork of the St. Joe River unit which is made up of several scattered but thrifty well-stocked plantations established in 1914-15. In most cases the white pine appears only on the north and west exposures. Yellow pine was planted on the dry, south exposure. Working conditions on this unit are difficult due to the presence of windfalls, brush density and in some cases steep rocky slopes.

Although the rust is present throughout the area it has not caused any serious damage. Part of the area worked this year will need some additional cleanup work in 1945 before protection is established.

METHODS AND EQUIPMENT

The same standard approved methods for hand ribes eradication used last year were applied again throughout the season. In most cases three men worked in each lane with a crew leader directly behind; in a few cases two men were used instead of three. Crews were worked in gang formation with a straw boss in direct charge of three to four crews. This method provided the necessary close supervision.

Chemical ribes eradication was on a small scale again this year being confined to mop-up work and the spraying of a few isolated patches.

A training school was held for blister rust supervisory personnel on May 22 and 23. These men were given complete schooling in all phases of the work. Straw bosses and crew men were given thorough training on the job.

During the month of June all Forest Service supervisory personnel and crew men were given intensive training in the use of tools and fire suppression methods and organization. A two-day school was held at each camp.

CHECKING

The regular and post check on worked areas which were temporarily discontinued in 1943 were activated during the 1944 season. Four teen-age boys from the 1943 eradication crews with above average ability to detect ribes were selected as trainees for checking assignments. The return of a former checker foreman from military service greatly facilitated in the training and supervision of the boys.

The use of teen-age boys as checkers necessitated modifications in the checking procedure to maintain production and efficiency. Such modifications in no way affected the ultimate objective of the checking work.

First, the boys lacked the ability to efficiently plan or organize their work. Second, they disliked working alone in the woods. Third, all had a natural reluctance to accept responsibility. Fourth, a 16-foot strip in brush and reproduction was too much ground for a teen-age lad to cover adequately.

Two boys were assigned to work together. One man ran compass; the other paced. The boys worked abreast and each worked an 8-foot strip. The interval between workers varied from $\frac{1}{2}$ to 1 chain depending upon the type of ground cover. The boy who paced used the compass man as a guide. He recorded the ribes found on his strip and those found by the compass man.

The two boys working together overcame the fear of being alone in the woods. Each had a certain responsibility to the other for procedure along the strip. The system tended to encourage a competitive attitude in the search for ribes which increased their efficiency. Having each man doing something tended to get away from the customary horse play. By having checkers working in adjacent areas the problem of supervision was greatly simplified.

It is realized that two men working together, each working an 8-foot strip, would not run twice as many strips as a man working alone. However, the increased efficiency plus more frequent samples of areas having a low ribes population more than compensated for any loss of area covered.

A total of 6,098 acres was checked during the season. In addition, 6,200 acres of the 1943 work areas were checked. Areas which were classified as post check within the 1944 work areas were inspected by the checkers prior to any work by the crews.

CONTROL STATUS

At the close of the 1944 field season the actual acreage covered on ribes eradication since 1923 was 538,459 acres. Of this total 368,179 were given one working, 145,110 acres worked twice and 25,170 acres worked for the third time. There remain 399,791 acres in the unworked classification.

In order to have the tables in this report show a clearer picture of accomplishments to date and future work remaining, a change in procedure has been adopted which shows a distinction between "gross acres" and "net acres". Gross acres refers to total acres worked prior to logging, burning or acres dropped from the control area. Net acres represents the acreage in each type which still remains in the control area and shows it under its current classification. This year 53,325 acres worked as mature type and now logged were reclassified as unworked cutover. A total of 89,475 acres of unworked mature which were previously carried in deferred status has been placed in the unworked classification.

During the past two years considerable work has been done on analyzing and classifying all areas within the control boundary. This analysis will be completed in 1945 and the complete results will appear in the 1945 report.

The results of blister rust control work on the St. Joe operation are very encouraging. On some areas the rust has intensified and considerable damage has been done. However, the percent of damage is not great compared to the vast acreage upon which control measures are being successfully applied. The complete success is dependent upon additional work which is urgently needed now.

TABLE 1

EXPENDITURES BY APPROPRIATIONS, CALENDAR YEAR 1944
ST. JOE OPERATION

Cooperating Agency	Appropriation	Amount
Bureau of Entomology and Plant Quarantine	Regular BLR-1-4	$ 17,357.36
	Regular BLR-3-4	29,670.88
	Subtotal	$ 47,028.24
State of Idaho Potlatch Timber Protective Association	State BLR-3-4	$ 3,596.10
	Private BLR-3-4	4,959.06
	Subtotal	$ 8,555.16
Forest Service	Regular BLR-4	$116,657.36
Total		$172,240.76

TABLE 2

CLASSIFIED EXPENDITURES, CALENDAR YEAR 1944
ST. JOE OPERATION

Item	Bureau of Entomology and Plant Quarantine				Forest Service	
	Regular BLR-1-4	Regular BLR-3-4	State and Private BLR-3-4	Total	Regular BLR-4	Total
Sal. perm. men	$12,165.24			$12,165.24	$ 4,012.32	$ 16,177.56
Sal. temp. men	1,206.95	$ 6,896.46		8,103.41	8,057.04	16,160.45
Wages, temp.labs.	1,621.19	22,664.42	$2,398.28	26,683.89	71,128.89	97,812.78
Subs. supplies	266.85	100.00	6,138.67	6,505.52	24,822.83	31,328.35
Equipment	112.99			112.99	6,274.49	6,387.48
Travel & transp.	665.11	4.45		669.56	1,546.88	2,216.44
Other supplies	1,319.03	5.55	18.21	1,342.79	814.91	2,157.70
Total	$17,357.36	$29,670.88	$8,555.16	$55,583.40	$116,657.36	$172,240.76

TABLE 3

SUMMARY OF RIBES ERADICATION, 1944
ST. JOE OPERATION

Working	Eradication Type	Year of Origin	Acres Worked	Man-Days	Ribes Destroyed	Per Acre	
						Man-Days	Ribes
First	Cutover	1920-39	501	1,012	69,853	2.02	139
	Reproduction	1910-39	210	789	22,656	3.76	108
	Total		711	1,801	92,509	2.53	130
Second	Reproduction	1910-39	948	2,043	36,393	2.16	38
	Pole		1,847	1,190	27,578	.64	15
	Total		2,795	3,233	63,971	1.16	23
Third	Cutover	1920-39	15	34	282	2.27	19
	Reproduction	1910-39	2,349	5,780	58,773	2.46	25
	Stream (3)		228	519	9,899	2.28	43
	Total		2,592	6,333	68,954	2.44	27
All Workings	Cutover	1920-39	516	1,046	70,135	2.03	136
	Reproduction	1910-39	3,507	8,612	117,822	2.46	34
	Pole		1,847	1,190	27,578	.64	15
	Stream (4)		228	519	9,899	2.28	43
	Total		6,098	11,367	225,434	1.86	37

Chemical work included above:

	Acres	Man-Days	Gallons Spray
(3)	43	46	575
(4)	43	46	575

TABLE 4

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1944
ST. JOE OPERATION

Working	Class	Acres	Effective Man-Days	Total Ribes	Gallons Spray	Per Acre Basis	
						Man-Days	Ribes
First	EQ-Coop.	633	1,448	80,327		2.29	127
	FS-Reg.	78	353	12,182		4.53	156
	Total	711	1,801	92,509		2.53	130
Second	EQ-Coop.	2,620	2,600	55,760		.99	21
	FS-Reg.	175	633	8,211		3.62	47
	Total	2,795	3,233	63,971		1.16	23
Third	EQ-Coop.	270	208	2,049	300	.77	8
	FS-Reg.	2,322	6,125	66,905	275	2.64	29
	Total	2,592	6,333	68,954	575	2.44	27
All Workings	EQ-Coop.	3,523	4,256	138,136	300	1.21	39
	FS-Reg.	2,575	7,111	87,298	275	2.76	34
	Total	6,098	11,367	225,434	575	1.86	37

TABLE 5

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1944
ST. JOE OPERATION

State	Working	Number of Acres Worked											
		By Forest Service			By Bureau of Entomology and Plant Quarantine				Total				
									Federal	Other			
		Natl. For.	Private	Total	Natl. For.	State	Private	Total	Natl. For.	State	Private	Total	Total
Idaho	First	78		78	50	583		633	128	583		583	711
	Second	165	10	175	290	2,330		2,620	455	2,330	10	2,340	2,795
	Third	2,322		2,322	80	120	70	270	2,402	120	70	190	2,592
	Total	2,565	10	2,575	420	3,033	70	3,523	2,985	3,033	80	3,113	6,098

TABLE 6

TOTAL RIBES BY SPECIES ERADICATED, 1944
ST. JOE OPERATION

Working	Eradication Type	Acres	Ribes by Species			Total Ribes
			Ribes lacustre	Ribes viscosissimum	Ribes petiolare	
First	Cutover (1920-39)	501	2,542	67,311		69,853
	Reproduction (1910-39)	210	1,797	20,859		22,656
	All Types	711	4,339	88,170		92,509
Second	Reproduction (1910-39)	948	19,741	16,640	12	36,393
	Pole	1,847	13,057	13,572	949	27,578
	All Types	2,795	32,798	30,212	961	63,971
Third	Cutover (1920-39)	15	282			282
	Reproduction (1910-39)	2,349	46,341	10,267	2,165	58,773
	Stream	228	5,790		4,109	9,899
	All Types	2,592	52,413	10,267	6,274	68,954
All Workings	Cutover (1920-39)	516	2,824	67,311		70,135
	Reproduction (1910-39)	3,507	67,879	47,766	2,177	117,822
	Pole	1,847	13,057	13,572	949	27,578
	Stream	228	5,790		4,109	9,899
	All Types	6,098	89,550	128,649	7,235	225,434

TABLE 7

SUMMARY OF RIBES ERADICATION, 1929-1944
ST. JOE OPERATION

Working	Eradication Type	Year of Origin	Gross Acres Worked	Man-Days	Ribes Destroyed	Per Acre		Net Acreage Remaining	
						Man-Days	Ribes	Worked	Unworked
First	Cutover	1940-44	265	189	14,002	.71	53	265	31,344
	Plantation	1940-44	2,209	4,763	1,092,843	2.16	495	2,209	0
	Cutover	1920-39	16,291	11,381	3,596,739	.70	221	16,291	156,962
	Reproduction	1910-39	217,573	239,939	80,753,499	1.10	371	217,573	105,121
	Pole		86,838	33,082	7,780,055	.38	90	86,838	18,516
	Mature		177,162	68,756	17,998,538	.39	102	123,837	87,848
	Miscellaneous		2,652	2,297	767,429	.87	289	2,652	-
	Stream (1)		35,469	97,121	23,358,708	2.74	659	35,469	-
	Total		538,459	457,528	135,361,813	.85	251	485,134	399,791
Second	Plantation	1940-44	745	638	53,382	.86	72	745	
	Cutover	1920-39	7,046	7,502	524,246	1.06	74	7,046	
	Reproduction	1910-39	78,437	93,478	9,075,436	1.19	116	78,437	
	Pole		36,848	21,735	1,318,108	.59	36	36,848	
	Mature		8,965	6,831	821,719	.76	92	8,055	
	Miscellaneous		431	43	2,567	.10	6	431	
	Stream (2)		12,638	27,514	5,191,492	2.18	411	12,638	
	Total		145,110	157,741	16,986,950	1.09	117	144,200	
Third	Cutover	1920-39	60	75	777	1.25	13	60	
	Reproduction	1910-39	13,559	23,442	685,330	1.73	51	13,559	
	Pole		4,287	2,602	69,994	.61	16	4,287	
	Mature		170	325	38,042	1.91	224	170	
	Stream (3)		7,094	12,537	1,677,259	1.77	236	7,094	
	Total		25,170	38,981	2,471,402	1.55	98	25,170	
All Workings	Cutover	1940-44	265	189	14,002	.71	53	265	31,344
	Plantation	1940-44	2,954	5,401	1,146,225	1.83	388	2,954	0
	Cutover	1920-39	23,397	18,958	4,121,762	.81	176	23,397	156,962
	Reproduction	1910-39	309,569	356,859	90,514,265	1.15	292	309,569	105,121
	Pole		127,973	57,419	9,168,157	.45	72	127,973	18,516
	Mature		186,297	75,912	18,858,299	.41	101	132,062	87,848
	Miscellaneous		3,083	2,340	769,996	.76	250	3,083	-
	Stream (4)		55,201	137,172	30,227,459	2.48	548	55,201	-
	Total		708,739	654,250	154,820,165	.92	218	654,504	399,791

Chemical work included above:

	Acres	Man-Days	Gallons Spray
(1)	7,404	21,683	669,706
(2)	3,245	4,731	111,663
(3)	1,068	844	19,818
(4)	11,717	27,258	801,187

TABLE 8

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1929-1944
ST. JOE OPERATION

Class	Gross Acres	Effective Man-Days	Total Ribes	Gallons Spray	Per Acre Basis	
					Man-Days	Ribes
EQ-Coop.	33,600	27,806	4,588,241	59,585	.83	137
EQ-Emerg.	234,519	157,898	43,593,387	77,088	.67	186
FS-Reg.	177,397	198,063	34,415,128	314,332	1.12	194
FS-Emerg.	70,981	45,138	15,333,106	101,476	.64	216
CCC	192,242	225,345	56,890,303	248,706	1.17	296
Total	708,739	654,250	154,820,165	801,187	.92	218

TABLE 9

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1929-1944
ST. JOE OPERATION

Working	Net Acres Worked in Control Area						
	Federal			Other			Total
	National Forest	Public Domain	Total	State	Private	Total	
First	215,376	12,458	227,834	57,898	199,402	257,300	485,134
Second	76,916	5,159	82,075	19,213	42,912	62,125	144,200
Third	14,803	1,027	15,830	1,651	7,689	9,340	25,170
Total	307,095	18,644	325,739	78,762	250,003	328,765	654,504

TABLE 10

PROGRESS OF FIRST WORKING BY OWNERSHIP CLASSES, 1929-1944
ST. JOE OPERATION

Ownership Class	Net Acres in Control Area		
	Worked	Unworked	Total
National Forest	215,376	96,832	312,208
Public Domain	12,458	12,007	24,465
Subtotal Federal	227,834	108,839	336,673
State	57,898	57,171	115,069
Private	199,402	233,781	433,183
Subtotal Other	257,300	290,952	548,252
Total	485,134	399,791	884,925

TABLE 11

TOTAL RIBES BY SPECIES ERADICATED, 1929-1944
ST. JOE OPERATION

Working	Eradication Type	Gross Acres	Ribes by Species						Total Ribes
			Ribes lacustre	Ribes viscosissimum	Ribes petiolare	Ribes inerme	Ribes irriguum	Ribes triste	
First	Cutover (1940-44)	265	10,308	3,694					14,002
	Plantation (1940-44)	2,209	158,749	933,486	161		447		1,092,843
	Cutover (1920-39)	16,291	1,132,425	2,452,653	8,329	2,120	1,212		3,596,739
	Reproduction (1910-39)	217,573	15,368,276	64,763,516	122,680	344,709	154,318		80,753,499
	Pole	86,838	3,234,919	4,383,484	21,170	63,499	76,983		7,780,055
	Mature	177,162	9,757,096	7,918,594	26,516	40,599	255,733		17,998,538
	Miscellaneous	2,652	148,445	615,565	1,987	1,432			767,429
	Stream	35,469	16,372,384	888,029	3,331,826	2,749,642	16,695	132	23,358,708
	All Types	538,459	46,182,602	81,959,021	3,512,669	3,202,001	505,388	132	135,361,813
Second	Plantation (1940-44)	745	8,165	45,217					53,382
	Cutover (1920-39)	7,046	285,707	227,775	1,765	2,781	6,218		524,246
	Reproduction (1910-39)	78,437	3,443,481	5,531,928	32,750	62,364	4,913		9,075,436
	Pole	36,848	572,299	721,515	5,807	18,483	4		1,318,108
	Mature	8,965	353,412	436,466		19	31,822		821,719
	Miscellaneous	431	456	2,111					2,567
	Stream	12,638	3,045,535	163,110	1,081,834	753,469	6,073	141,471	5,191,492
	All Types	145,110	7,709,055	7,128,122	1,122,156	837,116	49,030	141,471	16,986,950
Third	Cutover (1920-39)	60	666	111					777
	Reproduction (1910-39)	13,559	306,316	363,344	8,586	7,084			685,330
	Pole	4,287	49,625	20,183	42	144			69,994
	Mature	170	32,990	3,316	8		1,728		38,042
	Stream	7,094	793,270	23,044	488,054	370,509		2,382	1,677,259
	All Types	25,170	1,182,867	409,998	496,690	377,737	1,728	2,382	2,471,402
All Workings	Cutover (1940-44)	265	10,308	3,694					14,002
	Plantation (1940-44)	2,954	166,914	978,703	161		447		1,146,225
	Cutover (1920-39)	23,397	1,418,798	2,680,539	10,094	4,901	7,430		4,121,762
	Reproduction (1910-39)	309,569	19,118,073	70,658,788	164,016	414,157	159,231		90,514,265
	Pole	127,973	3,856,843	5,125,182	27,019	82,126	76,987		9,168,157
	Mature	186,297	10,143,498	8,358,376	26,524	40,618	289,283		18,858,299
	Miscellaneous	3,083	148,901	617,676	1,987	1,432			769,996
	Stream	55,201	20,211,189	1,074,183	4,901,714	3,873,620	22,768	143,985	30,227,459
	All Types	708,739	55,074,524	89,497,141	5,131,515	4,416,854	556,146	143,985	154,820,165

BLISTER RUST CONTROL WORK, COEUR D'ALENE OPERATION, 1944

By
M. C. Riley, Operation Supervisor
C. J. Pederson, Forester, U. S. Forest Service

INTRODUCTION

The blister rust control program on the Coeur d'Alene National Forest during the 1944 season was conducted by four crews financed from regular Forest Service appropriations. A total of 3,549 acres were worked, consisting of 662 acres of first working, 1,352 acres of second and 1,535 of third working.

There was a larger nucleus of experienced workers than in 1943 and more experienced camp foremen were available. The season was characterized by an abnormal amount of fire fighting. This activity, plus a combination of early season wet weather, a late start and the early return of workers to their homes, permitted only about five weeks of effective ribes eradication work.

The first camp was established on May 1 and was occupied by eradication crews on May 27. The last camp was established on June 20. The first camp closed on August 19 and all were closed by September 1.

In order to present a better analysis of actual progress in accomplishing control, a distribution has been made between gross acres and net acres. Gross acres refers to the total area worked in each type including those which have been dropped from the control area or have been logged since working, and net acres refers to the actual acreage of each type remaining in the control area. These changes make it possible to show worked or unworked area by types within the control area.

The Forest Service was responsible for the administration and maintenance of the camps and technical supervision was provided by the Bureau of Entomology and Plant Quarantine.

The total number of workers was 221.

LOCATION AND DESCRIPTION OF AREAS

Ribes eradication efforts were confined to plantations, hemlock-removal areas and stands of natural reproduction. The Nowhere crew performed second and third working on plantations on New Deal, President, Davy and Senator Creeks. This portion of the worked area lies in secs. 12, 13 and 14, T. 52 N., R. 2 E. and secs. 7, 8, 17 and 18, T. 52 N., R. 3 E. This is all 1935 plantation except New Deal Creek which was planted in 1936. The Independence crew performed second working in all of the 1935 plantation below the mouth of Owl Creek and first working in 1931 plantations on the lower end of Yellowpine and Trident Creeks and some natural reproduction near the mouth of Minor Creek. This area is located in secs. 28, 29, 31, 32 and 33, T. 53 N., R. 2 E. and secs. 4, 5, 6, 8 and 9, T. 52 N., R. 2 E. The Hudlow crew worked for the

second time the hemlock-removal area on lower Solitaire Creek where planting was done in 1942, third working on Honey Burn, planted in 1941 by direct spot seeding and on the Middle Fork of Hudlow Creek in both plantation and natural reproduction areas. This crew worked in secs. 5, 6, 16, 17 and 30, T. 52 N., R. 1 W., secs. 24 and 25, T. 52 N., R. 2 W., secs. 31 and 32, T. 53 N., R. 1.W. and sec. 36, T. 53 N., R. 2 W. The Bottom Creek crew performed third working in natural reproduction following logging on Burnt Cabin Creek opposite the mouth of Bottom Creek in sec. 13, T. 51 N., R. 2 W. and sec. 18, T. 51 N., R. 1 W.

The plantation areas worked by the Nowhere and Independence crews represented comparatively easy working conditions. Stream type on lower Independence Creek, where original work had been done by the bulldozer method, contained fewer ribes than are usually found on this type of area, while stream type along the Coeur d'Alene River near the mouth of Senator Creek represented extremely difficult working conditions. The hemlock-removal area on Solitaire and the Honey Burn contained many dwarf bushes and the presence of a heavy growth of fireweed made ribes eradication difficult. Natural reproduction areas generally involved rather severe working conditions because of windfalls and brush.

All areas worked are in Federal ownership.

WORKING METHODS

More experienced workers were available this season than in the previous year and the higher caliber of workers made possible the use of more assistant camp foremen and straw bosses. However, it was necessary to carry on a continual training program. In general, the method of a crew leader working behind each crew with a group of crews working in adjacent lanes was used. In some cases in the plantation areas where visibility was very good it was possible to use individual three-man crews with the crew leader working in line. This method was used whenever possible. String lines were laid in advance and less difficulty was experienced in this phase of the work than formerly. The improved ribes tool was used by all crew members and the Sheely hook was used by crew leaders and straw bosses. All workers were given training in the proper use of common woods tools before any ribes eradication work was undertaken. The practice initiated last season of the camp foreman interviewing each worker upon his arrival in camp was continued. The benefits derived are very worthwhile.

Visual training through the medium of motion pictures proved to be an effective aid in conducting a successful safety program.

CHECKING AND SURVEYS

Only one experienced checker was available at the start of the season but three others, two of whom had previous ribes eradication experience, were trained early in the season. Before eradication workers arrive, all available

camp foremen and assistants were used for post check work on the Nowhere area. Post and advance checks were run on the Independence area prior to working. During the season post check was also conducted on reproduction areas on and adjacent to Bennett and Cardinal Creeks, Deception Creek, and Brett Creek.

Regular check was performed on practically all of the area worked this season. The only exceptions were in areas where the number of ribes removed was such that it was evident that additional working would be necessary, such as heavy stream type along the Coeur d'Alene River on the Nowhere area. Generally speaking, regular check shows that very satisfactory work was performed, especially on plantation areas. On the hemlock-removal areas there still remain patches of area which need further work, due principally to dwarf bushes occurring where visibility is very poor. Some of the natural reproduction stands will need further work but on the majority of these areas the work was satisfactory. A portion of the stream type which was worked for the second time shows a rather high check but this is in areas where there is very little infection.

Only a small amount of disease survey was conducted during the season due to the fact that all checkers were needed for regular check and only one man was available for the work after the ribes eradication season. Disease survey strips were run at Sands Creek on the Deception Creek Experimental Forest, Bear Creek and on the Flat Creek sanitation area which was planted in 1941. The results of this survey are summarized as follows:

Area	Miles Strip	Trees Examined	Trees Infected	Percent Infection
Sands Creek, sec. 32, T. 51 N., R. 1 W.	4.7	3,913	124	3.17
Bear Creek, secs. 5, 6, 7, 8, T. 51 N., R. 3 E.	3.6	1,006	68	6.76
Flat Creek, secs. 11, 12, 13, T. 52 N., R. 1 E.	7.1	3,921	38	.97

On Sands Creek the amount and distribution of infection and the age of the cankers indicate that work should be done here immediately to prevent a rapid build-up of the disease. Figures for Bear Creek, which is an unworked natural reproduction area, show the majority of infection to be within 10 chains of the stream. On the Flat Creek hemlock-removal area the bulk of infection is near the adjacent mature stand. These areas should be worked in 1945.

Approximately two months were spent by three of the permanent personnel after the end of the ribes eradication season continuing the area classification work started in the fall of 1943. In general, the area classified includes the remainder of the North Fork of the Coeur d'Alene River including Canyon and Laverne Creeks, Tepee drainage and portions in and around Shoshone Creek (formerly Big Creek) including Falls, Bridge, Loading and Uranus Creeks. This classification work revealed some excellent white pine areas which had not been worked and also brought out more clearly the point noticed last

season, that on the North Fork area very few cutover areas will reproduce to white pine without some form of stand improvement or sanitation. Further examples of this occur on Sob, Barney, Little, Bootjack and Leiberg Creeks and along the river face adjacent to these areas. Apparently this is also true of sizable areas on Shoshone Creek. A higher percentage of area examined this year goes into the deferred classification than was true last season because such high priority areas as plantations and good natural reproduction stands were examined during 1943.

The classification work this fall revealed a large number of areas where post check work is needed and served to emphasize again to what great extent this phase of the program is behind schedule.

Practically all of the area south of Township 51 North remains to be classified.

CONTROL STATUS

Until classification work is completed, any control status figures applying to the entire operation are subject to continual change since the post check program is so much behind schedule. The work performed during the 1944 field season resulted in approximately 2,183 acres of that work being classed as on a maintenance basis, 623 acres needing post check and 713 acres needing rework.

Post check surveys on areas not worked during the current season resulted in 1,675 acres classed as being on a maintenance basis and 650 acres needing rework.

STATEMENT OF EXPENDITURES AND COSTS

The statement of expenditures and costs is shown in the following tables by the cooperative agency and the type of appropriation:

TABLE 1

EXPENDITURES BY APPROPRIATIONS, CALENDAR YEAR 1944
COEUR D'ALENE OPERATION

Cooperating Agency	Appropriation	Amount
Bureau of Entomology and Plant Quarantine	Regular BLR-1-4	$ 3,239.74
Forest Service	Regular BLR-4	85,656.69
Total		$88,896.43

TABLE 2

CLASSIFIED EXPENDITURES, CALENDAR YEAR 1944
COEUR D'ALENE OPERATION

Item	Bureau of Entomology and Plant Quarantine Regular BLR-1-4	Forest Service Regular BLR-4	Total
Sal. perm. men	$3,121.20	$ 4,482.85	$ 7,604.05
Sal. temp. men		6,044.78	6,044.78
Wages, temp. labs.		57,928.82	57,928.82
Subs. supplies		12,791.48	12,791.48
Equipment		3,497.97	3,497.97
Travel and transp.	118.54	614.02	732.56
Other supplies		296.77	296.77
Total	$3,239.74	$85,656.69	$88,896.43

TABLE 3

SUMMARY OF RIBES ERADICATION, 1944
COEUR D'ALENE OPERATION

Working	Eradication Type	Year of Origin	Acres Worked	Man-Days	Ribes Destroyed	Per Acre	
						Man-Days	Ribes
First	Reproduction	1910-39	662	525	27,207	.79	41
Second	Reproduction	1910-39	1,123	1,249	27,018	1.11	24
	Pole		35	59	2,989	1.69	85
	Mature		20	121	8,390	6.05	420
	Stream		174	462	17,194	2.66	99
	Total		1,352	1,891	55,591	1.40	41
Third	Plantation	1940-44	236	548	25,096	2.32	106
	Cutover	1920-39	417	1,001	25,051	2.40	60
	Reproduction	1910-39	665	1,162	7,109	1.75	11
	Mature		61	129	4,592	2.11	75
	Stream		156	709	20,021	4.54	128
	Total		1,535	3,549	81,869	2.31	53
All Workings	Plantation	1940-44	236	548	25,096	2.32	106
	Cutover	1920-39	417	1,001	25,051	2.40	60
	Reproduction	1910-39	2,450	2,936	61,334	1.20	25
	Pole		35	59	2,989	1.69	85
	Mature		81	250	12,982	3.09	160
	Stream		330	1,171	37,215	3.55	113
	Total		3,549	5,965	164,667	1.68	46

TABLE 4

TOTAL RIBES BY SPECIES ERADICATED, 1944
COEUR D'ALENE OPERATION

Working	Eradication Type	Year of Origin	Acres	Ribes by Species				Total Ribes
				Ribes lacustre	Ribes viscosissimum	Ribes inerme	Ribes irriguum	
First	Reproduction	1910-39	662	15,091		12,116		27,207
Second	Reproduction	1910-39	1,123	21,507	5,511			27,018
	Pole		35	2,989				2,989
	Mature		20	7,308	1,082			8,390
	Stream		174	6,732		10,462		17,194
	Total		1,352	38,536	6,593	10,462		55,591
Third	Plantation	1940-44	236	21,819	3,277			25,096
	Cutover	1920-39	417	24,897	154			25,051
	Reproduction	1910-39	665	3,914	2,597	581	17	7,109
	Mature		61	4,201	391			4,592
	Stream		156	10,030	89	9,894	8	20,021
	Total		1,535	64,861	6,508	10,475	25	81,869
All Workings	Plantation	1940-44	236	21,819	3,277			25,096
	Cutover	1920-39	417	24,897	154			25,051
	Reproduction	1910-39	2,450	40,512	8,108	12,697	17	61,334
	Pole		35	2,989				2,989
	Mature		81	11,509	1,473			12,982
	Stream		330	16,762	89	20,356	8	37,215
	Total		3,549	118,488	13,101	33,053	25	164,667

TABLE 5

SUMMARY OF RIBES ERADICATION, 1927-1944
COEUR D'ALENE OPERATION

Working	Eradication Type	Year of Origin	Gross Acres Worked	Man-Days	Ribes Destroyed	Per Acre		Net Acreage Remaining	
						Man-Days	Ribes	Worked	Unworked
First	Cutover	1940-44							7,648
	Burn	1940-44	716	351	53,652	.49	75	716	246
	Plantation	1940-44	787	1,660	431,014	2.11	548	787	432
	Cutover	1920-39	16,231	21,084	5,314,713	1.30	327	16,231	19,378
	Reproduction	1910-39	89,489	138,607	20,678,429	1.55	231	87,666	8,190
	Pole		65,866	31,254	4,479,922	.47	68	65,130	8,765
	Mature		141,096	97,729	13,798,358	.68	98	123,079	9,310
	Miscellaneous		13,312	16,655	2,961,278	1.25	222	12,888	325
	Stream		14,808	57,225	11,770,618	3.86	795	14,700	2,715
	Total		342,305	354,565	59,487,984	1.04	174	321,197	57,009
Second	Plantation	1940-44	363	776	102,578	2.14	283	363	
	Cutover	1920-39	8,786	12,237	1,902,030	1.39	216	8,786	
	Reproduction	1910-39	16,237	26,861	1,741,825	1.65	107	15,554	
	Pole		4,816	3,093	485,788	.64	101	4,816	
	Mature		9,963	7,588	795,798	.76	80	9,663	
	Miscellaneous		1,382	2,760	353,465	2.00	256	1,382	
	Stream		7,615	13,555	1,538,698	1.78	202	7,507	
	Total		49,212	66,870	6,920,182	1.36	141	48,071	
Third	Plantation	1940-44	513	919	51,175	1.79	100	513	
	Cutover	1920-39	2,920	4,892	263,217	1.68	90	2,920	
	Reproduction	1910-39	2,421	4,483	189,057	1.85	78	1,814	
	Pole		482	497	50,612	1.03	105	482	
	Mature		1,544	1,072	66,448	.69	43	1,544	
	Miscellaneous		13	11	1,424	.85	110	13	
	Stream		1,372	2,140	121,162	1.56	88	1,372	
	Total		9,265	14,014	743,095	1.51	80	8,658	
All Workings	Burn	1940-44	716	351	53,652	.49	75	716	
	Plantation	1940-44	1,663	3,355	584,767	2.02	352	1,663	
	Cutover	1920-39	27,937	38,213	7,479,960	1.37	268	27,937	
	Reproduction	1910-39	108,197	169,951	22,609,311	1.57	209	105,034	
	Pole		71,164	34,844	5,016,322	.49	70	70,428	
	Mature		152,603	96,389	14,660,604	.63	96	134,286	
	Miscellaneous		14,707	19,426	3,316,167	1.32	225	14,283	
	Stream		23,795	72,920	13,430,478	3.06	564	23,579	
	Total		400,782	435,449	67,151,261	1.09	168	377,926	

TABLE 6

SUMMARY OF RIBES ERADICATION
BY CLASSES OF CAMPS, 1927-1944
COEUR D'ALENE OPERATION

Class	Gross Acres	Effective Man-Days	Total Ribes	Per Acre Basis	
				Man-Days	Ribes
EQ-Reg.	25,776	8,351	2,846,383	.32	110
EQ-Emerg.	41,039	35,541	6,589,217	.87	161
FS-Reg.	73,985	84,658	13,950,029	1.14	189
FS-Emerg.	111,711	86,897	17,620,173	.78	158
CCC	148,271	220,002	26,145,459	1.48	176
Total	400,782	435,449	67,151,261	1.09	168

TABLE 7

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1927-1944
COEUR D'ALENE OPERATION

Working	Net Acres Worked in Control Area				
	Federal	Other			Total
	National Forest	State	Private	Total	
First	305,053	5,427	10,717	16,144	321,197
Second	45,827	440	1,804	2,244	48,071
Third	8,529	45	84	129	8,658
All Workings	~~385,409~~ 359,409	5,912	12,605	18,517	377,926

TABLE 8

PROGRESS OF FIRST WORKING
BY OWNERSHIP CLASSES, 1927-1944
COEUR D'ALENE OPERATION

Ownership Class	Net Acres in Control Area		
	Worked	Unworked	Total
National Forest	305,053	50,058	355,111
State	5,427	711	6,138
Private	10,717	6,240	16,957
Subtotal Other	16,144	6,951	23,095
Total	321,197	57,009	378,206

TABLE 9

TOTAL RIBES BY SPECIES ERADICATED, 1927-1944
COEUR D'ALENE OPERATION

Working	Eradication Type	Gross Acres	Ribes by Species					Total Ribes
			Ribes lacustre	Ribes viscosissimum	Ribes petiolare	Ribes inerme	Ribes irriguum	
First	Burn (1940-44)	716	47,019	6,633				53,652
	Plantation (1940-44)	787	324,914	106,100				431,014
	Cutover (1920-39)	16,231	3,806,948	1,462,643	1	17,536	27,585	5,314,713
	Reproduction (1910-39)	89,489	12,164,944	7,882,039	2,227	526,767	102,452	20,678,429
	Pole	65,866	2,612,374	1,799,139	12,246	12,823	43,340	4,479,922
	Mature	141,096	10,712,514	2,845,919	1	89,402	150,522	13,798,358
	Miscellaneous	13,312	1,294,074	1,626,473		31,121	9,610	2,961,278
	Stream	14,808	7,251,355	183,261	31,474	4,236,141	68,387	11,770,618
	All Types	342,305	38,214,142	15,912,207	45,949	4,913,790	401,896	59,487,984
Second	Plantation (1940-44)	363	86,669	15,909				102,578
	Cutover (1920-39)	8,786	1,561,390	323,954		13,606	3,080	1,902,030
	Reproduction (1910-39)	16,287	935,192	784,569		13,229	8,835	1,741,825
	Pole	4,816	364,939	111,666	4,736	3,882	565	485,788
	Mature	9,963	511,401	268,971		11,089	4,337	795,798
	Miscellaneous	1,382	163,878	189,587				353,465
	Stream	7,615	1,068,439	43,758		420,500	6,001	1,538,698
	All Types	49,212	4,691,908	1,738,414	4,736	462,306	22,818	6,920,182
Third	Plantation (1940-44)	513	46,607	4,568				51,175
	Cutover (1920-39)	2,920	225,776	37,441				263,217
	Reproduction (1910-39)	2,421	118,182	69,210		1,648	17	189,057
	Pole	482	40,422	10,190				50,612
	Mature	1,544	64,171	2,277				66,448
	Miscellaneous	13	129	1,295				1,424
	Stream	1,372	83,174	202		37,778	8	121,162
	All Types	9,265	578,461	125,183		39,426	25	743,095
All Workings	Burn (1940-44)	716	47,019	6,633				53,652
	Plantation (1940-44)	1,663	458,190	126,577				584,767
	Cutover (1920-39)	27,937	5,594,114	1,824,038	1	31,142	30,665	7,479,960
	Reproduction (1910-39)	108,197	13,218,318	8,735,818	2,227	541,644	111,304	22,609,311
	Pole	71,164	3,017,735	1,920,995	16,982	16,705	43,905	5,016,322
	Mature	152,603	11,288,086	3,117,167	1	100,491	154,859	14,660,604
	Miscellaneous	14,707	1,458,081	1,817,355		31,121	9,610	3,316,167
	Stream	23,795	8,402,968	227,221	31,474	4,694,419	74,396	13,430,478
	All Types	400,782	43,484,511	17,775,804	50,685	5,415,522	424,739	67,151,261

BLISTER RUST CONTROL WORK, KANIKSU OPERATION, 1944

By
H. A. Brischle, Operation Supervisor
G. M. Houghton, Checker Foreman

The Kaniksu operation is composed of the valuable stands of white pine timber in Bonner and Boundary Counties in northern Idaho and Pend Oreille County in Northeastern Washington. Within these 4,300 square miles of valuable timber are the lands administered by the Kaniksu National Forest, the Priest Lake Timber Protective Association, portions of the Pend Oreille Timber Association, as well as state and private ownership.

Due to the demands of the armed forces and war industries, logging operations are going on at a rapdid rate in mature stands through the entire forest. Stands of white pine as well as mixed have rapidly diminished during the past three years of heavy cutting. Much control work will be necessary from now on to protect the young stands of white pine as they become established on these cutover areas. At the present time there are 26,000 acres of cutover in the 1920-1939 group to be post checked and portions worked. There are 39,000 acres of cutover in the 1940-1944 group to be post checked, much of which will require work.

The year 1944 was again characterized by a shortage of labor and supervisory personnel. Labor consisted of boys under 18 years of age and war internees. The boys were mostly local, but a few came from distant parts of the United States. A good number of the boys proved to be too immature for the work, and as a result the turnover was heavy. Many of the boys had never had a full time job of any kind before. Some had never been away from home. Much supervision and training was necessary to get such immature and inexperienced crews trained for work.

The work program consisted of five Forest Service regular camps varying in man power from 30 to 60 men, one internee camp of 85 men, and two internee camps of 35 men each. There were also two Bureau Cooperative camps, one of 60 men and one of 30. These two were financed on a cooperative basis between the federal government, the state of Idaho, and the Priest Lake Timber Protective Association. With the exception of the internee camps most of the camps were operated throughout the season with less than full strength because of turnover and the shortage of replacements.

ORGANIZATION AND ADMINISTRATION

The first camp was established on May 15; others were established through May and all were located by June 20. The internee camps continued eradication work through September. All other camps were closed by September 1. The camps were called on several fires on the forest and to fires on the Coeur d'Alene and St. Joe Forests. A total of 851 man-days were spent on fire suppression by the regular crews and 2,687 man-days were spent on fires by the internees.

There was no personnel available for the position of unit supervisor. This phase of the job was handled by Leonard J. Easley and Harold A. Brischle in the forest and internee camps. Gilbert M. Houghton supervised the checking for the entire operation and in addition acted as unit supervisor for the Bureau Cooperative camps.

Kalispell Bay served as the operation headquarters for both Forest Service and Bureau camps. The clerical work necessary in the ordering of supplies, equipment, preparation of pay rolls, reports, property records, etc., was under the supervision of Harry S. Peters. One internee assisted with the clerical work and warehousing. Deliveries to isolated camps were made by pack stock. Other camps were serviced by truck.

The organization was as follows:

H. A. Brischle, Operation Supervisor
L. J. Easley, Assistant Operation Supervisor
G. M. Houghton, Checker Foreman
Harry S. Peters, Assistant to Operation Supervisor

The above officers supervised and administered both the Bureau of Entomology and Plant Quarantine and Forest Service camps.

Program	Number Camps	Number Workers	Number Checkers
FS-Regular	5	200	2
FS-Internee	3	155	1
EQ-Cooperative	2	100	1

Total number of men employed on blister rust control - 459

An active safety and accident prevention campaign was carried on throughout the summer. Boys were taught the use of tools and all safety precautions necessary on the job. There were only two lost-time accidents on the operation.

DESCRIPTION OF AREAS AND LOCATION OF WORK

Bureau Cooperative Camps

Camp 401	Township	Range	Sections in Which Work Was Performed
Big Creek	57 N.	3 W.	5,6
	57 N.	4 W.	1,2,3
	58 N.	3 W.	31
	58 N.	4 W.	36

This was a troublesome area. Logging operations were carried on from 1929 to 1934 in this drainage. The ribes were small, well screened, and difficult to find. The area had been worked twice before. Much rework and mopping up were

necessary to get the area to acceptable standards.

Camp 402	Township	Range	Sections in Which Work Was Performed
Soldier Creek	60 N.	3 W.	27,28,34

The work in this drainage was done in a stand of white pine reproduction originating after a 1919 burn. It was first work. The ribes were numerous, large, and difficult to pull. The average was 161 bushes per acre requiring an average of 1.93 man-days per acre.

Forest Service Camps (Regular)

Camp 400	Township	Range	Sections in Which Work Was Performed
Kalispell Bay	59 N.	5 W.	10,11,12
	60 N.	5 W.	2,9,11,12
	61 N.	5 W.	27,34
	62 N.	5 W.	25,36
	36 N.	45 E.	1,6,7,12 (Washington)

This camp was located at Blister Rust Headquarters. The crew was hauled to work by truck. The work was done in plantations, reproduction, and cutover areas within a radius of 15 miles from headquarters. This camp was an efficient arrangement as it cut down the expense of maintaining a headquarters, and four different areas were worked without having to set up or move a camp. The Diamond Creek plantation, the Binarch Creek cutover, and the reproduction of Granite Mountain and Kedish Mountain were the upland areas worked. In addition the stream type on Kalispell Creek was worked. Production was good as the crews pulled an average of 83 bushes per acre at the rate of .75 man-days per acre.

Camp 454	Township	Range	Sections in Which Work Was Performed
Upper Tillicum Creek	37 N.	45 E.	4,5 (Washington)

This camp did work in a stand of reproduction originating after the 1926 burn. Most of the work was done in areas which had been covered before. The ground cover made the search and elimination of ribes difficult. Reproduction was thick and the numerous windfalls on the forest floor made both visibility and eradication difficult. The camp personnel was re-grouped on August 1 with other forest camps to make way for a group of Mexicans. The Mexicans were later transferred to a road construction camp. As a result this area was not finished.

Camp 455	Township	Range	Sections in Which Work Was Performed
Lower Tillicum Creek	37 N.	45 E.	2,3,4,10,11 (Washington)

This camp worked in white pine reproduction originating after a 1926 burn. Most of the work was done in areas which had been covered once and twice before. The visibility was poor and the ribes were light and scattered. The area was completely worked.

Camp 453	Township	Range	Sections in Which Work Was Performed
South Fk. Granite Cr.	37 N.	45 E.	16,17,20,21 (Washington)

This camp performed work in an area of white pine reproduction originating after a 1926 burn. Previous eradication work had been done in this area. The ground coverage made it difficult for the crews to work as it was steep, brushy, and covered with windfalls. An acceptable standard was maintained and the camp finished the work outlined for them.

German Internee Camps

Pelke Camp	Township	Range	Sections in Which Work Was Performed
	34 N.	45 E.	1,6 (Washington)
	35 N.	45 E.	36 "
	59 N.	5 W.	7,8,9,14,15,16,17,20,21,22,23 (Idaho)

This camp worked almost entirely in cutover areas which had been logged from 1920 to 1939. Portions of the area were heavily covered with seedling ribes. The major stream type of the Upper West Branch of Priest River was worked.

Boswell Camp	Township	Range	Sections in Which Work Was Performed
	33 N.	45 E.	1,2,11,12,13,15,21,22,23,26,27,28,35 (Wash.)
	33 N.	46 E.	6,7,18,19 (Washington)

The area worked by the internees stationed in this camp was scattered over seventeen sections. It was entirely in stands of pole and cutover areas. The ribes were small and numerous. They averaged 178 to an acre and required 1.5 man-days per acre to eradicate.

Camp F-164	Township	Range	Sections in Which Work Was Performed
	57 N.	5 W.	1,2,7,17,26,27,30,35
	57 N.	6 W.	6
	58 N.	5 W.	19,20,29,30,31,36
	32 N.	46 E.	31 (Washington)

The work performed by the internees stationed in this camp was in the Quartz Creek, the Cuban Hill, and the Pine Creek planted areas. The cutover areas near Moore Creek and the Lower West Branch of Priest River were also worked. Heavy brush and steep terrain were encountered in working the protection zone adjacent to the planted areas.

After the completion of the eradication work one crew of internees worked on pruning and canker elimination on the Cuban Hill plantation. A total of 17,133 trees were pruned. Of these 1,213 were cut down for being infected with trunk or killing cankers.

CHECKING AND PINE DISEASE SURVEY

The checking force was composed of one Bureau and two Forest Service checkers.

Of the 15,489 acres worked 12,355 were checked. All areas that did not meet an acceptable eradication standard according to checking data were reworked.

The personnel problems which confronted the eradication force also applied to the checking personnel. No checkers were used, however, who had not had previous experience in blister rust work. These checkers were of high school age and not as competent as regular checkers used in the past. The boys were picked for this work by their accuracy in finding ribes. Their efficiency in finding ribes on check strips was good. A number of sample strips were run by the checker foreman on the checkers' work and some pine disease information was secured on areas checked during the season. In all cases the data of the checkers were substantiated. The main objective of finding ribes and designating areas needing rework was accomplished. The young checkers, due to the lack of experience, were not able to fully interpret the results of the data gathered. This deficiency was somewhat overcome by working the checkers in groups in order that they might have close supervision of the checker foreman.

PINE DISEASE SURVEY

A party of four men conducted a pine disease survey from the fifth of September through the fifteenth of October. Eight drainages were examined. All examinations were made on reproduction or plantation areas. A direct comparison is made on some of the areas previously surveyed. These comparisons and the results of the survey in general are encouraging. Less than two percent of the trees infected had cankers on 1941 and later wood. The gain in white pine reproduction from 1936 through 1944 has been 52 percent. A gain in reproduction over the spread of the rust has occurred in all drainages excepting the South Fork of Granite Creek where the rust has increased from five percent in 1941 to 22 percent found in 1944. The gain in white pine has been ten percent in this drainage.

The drainages surveyed and the data found are listed below:

UPPER WEST BRANCH AND PAQUA CREEK

Number examined	783
Number infected	268
Percent of infection	34
Percent of loss	27
Pine per acre	783

The majority of the cankers found were on 1940 wood indicating the severity of the 1941 spread of the rust. It is planned to rework this area in the near future. The ribes are few in number but scattered. It will not be hard to control this area from the spread of the rust. This area received its only working in 1938.

UPPER WEST BRANCH SWITCH BACK AREA

Number examined	485
Number infected	100
Percent infected	20
Percent loss	19
Pine per acre	1600

This area has had only one working which was done in 1938. At that time ribes were extremely heavy and difficult to eradicate. Infection was well established as early as 1935.

SOUTH FORK OF GRANITE CREEK

Number examined	1928
Number infected	555
Percent infection	28
Percent loss	11
Pine per acre	714

A direct comparison of this troublesome area is shown below.

1944		1941	
Number examined	1392	Number examined	5233
Number infected	305	Number infected	281
Percent infection	22	Percent infected	5
Pine per acre	730	Pine per acre	654

It is to be noted that the pine is still increasing in this area even though the spread of the rust has increased. A good eradication job was performed on the area this year. The majority of the cankers found were introduced by the heavy wave of 1941 infection.

PINE CREEK PLANTATION

Number examined	200
Number infected	86
Percent infection	43
Percent loss	21
Pine per acre	650

This area was worked in 1944 and pruned after the termination of eradication work. There are now less than 2 ribes and 4 feet of live stem per acre remaining. The removal of cankers from the plantation should materially aid in retarding the spread of the rust in the future.

CUBAN HILL PLANTATION

Number examined	384
Number infected	83
Percent infected	22
Percent loss	11
Pine per acre	750

DIRECT COMPARISON OF CUBAN HILL 1944 AND 1941

1944		1941	
Number examined	314	Number examined	1139
Number infected	55	Number infected	22
Percent infected	14	Percent infection	2
Pine per acre	750	Pine per acre	750

This area was planted in 1932. The growth of the trees has been vigorous. The majority of the cankers are on 1941 wood and are limb cankers. The plantation is closing in rapidly and soon a great number of the cankers will be eliminated by natural pruning. This plantation was worked this year.

"CAMP 15 ROAD" (PLANTATION)

Number examined	314
Number infected	17
Percent infected	.8
Percent loss	.8
Pine per acre	870

This area was snagged and burned in 1938. It was planted in the spring of 1941. No ribes were found in the plantation.

INDIAN CREEK

Number examined	373
Number infected	37
Percent infected	10
Percent loss	8

The effects of an early eradication work are clearly shown in this drainage. The reproduction is closing in fast. Another eradication job is planned for the area in the near future.

HUNT CREEK

Number examined	605
Number infected	30
Percent infected	5
Percent loss	4

This area was first worked in 1934. There were 300 ribes eradicated per acre. The area was again worked in 1939. The eradication has stood up well, and the area was greatly benefited by this early ribes eradication.

TABLE 1

EXPENDITURES BY APPROPRIATIONS, CALENDAR YEAR 1944
KANIKSU OPERATION

Cooperating Agency	Appropriation	Amount
Bureau of Entomology and Plant Quarantine	Regular BLR-1-4	$ 9,422.18
	Regular BLR-3-4	23,802.81
	Subtotal	$ 33,224.99
State of Idaho	State BLR-3-4	$ 4,287.83
Priest Lake Timber Protective Association	Private BLR-3-4	4,259.42
	Subtotal	$ 8,547.25
Forest Service	Regular BLR-4	$140,520.80
Total		$182,293.04

TABLE 2

CLASSIFIED EXPENDITURES, CALENDAR YEAR 1944
KANIKSU OPERATION

Item	Bureau of Entomology and Plant Quarantine				Forest Service	Total
	Regular BLR-1-4	Regular BLR-3-4	State and Private BLR-3-4	Total	Regular BLR-4	
Sal. perm. men	$5,304.38			$ 5,304.38	$ 5,276.60	$ 10,580.98
Sal. temp. men	1,322.13	$ 3,605.63		4,927.76	15,906.39	20,834.15
Wages, temp. labs.	1,187.28	17,965.79	$5,632.59	24,785.66	82,377.19	107,162.85
Subs. supplies	174.90	2,152.18	2,869.94	5,197.02	23,846.77	29,043.79
Equipment	132.30			132.30	4,366.62	4,498.92
Trucks						
Travel & transp.	742.71	63.29		806.00	2,605.36	3,411.36
Other Supplies	558.48	15.92	44.72	619.12	6,141.87	6,760.99
Total	$9,422.18	$23,802.81	$8,547.25	$41,772.24	$140,520.80	$182,293.04

TABLE 3

SUMMARY OF RIBES ERADICATION, 1944
KANIKSU OPERATION

Working	Eradication Type	Year of Origin	Acres Worked	Man-Days	Ribes Destroyed	Per Acre Man-Days	Per Acre Ribes
First	Cutover	1940-44	606	381	33,871	.63	56
	Burn	1940-44	210	184	47,333	.88	225
	Plantation	1940-44	365	195	42,426	.53	116
	Cutover	1920-39	1,428	1,406	202,315	.98	142
	Reproduction	1910-39	348	1,028	107,420	2.95	309
	Mature		170	81	7,727	.48	45
	Stream		4	18	1,684	4.50	421
	Total		3,131	3,293	442,776	1.05	141
Second	Cutover	1920-39	786	1,349	53,164	1.72	68
	Reproduction	1910-39	3,497	3,098	93,086	.89	27
	Pole		241	339	45,315	1.41	188
	Mature		536	341	13,389	.64	25
	Stream		1,713	2,264	201,690	1.32	118
	Total		6,773	7,391	406,644	1.09	60
Third	Cutover	1920-39	1,764	2,117	176,242	1.20	100
	Reproduction	1910-39	3,214	2,948	65,302	.92	20
	Pole		139	39	1,035	.28	7
	Mature*		199	199	50,198	1.00	252
	Stream		269	429	7,133	1.59	27
	Total		5,585	5,732	299,910	1.03	54
All Workings	Cutover	1940-44	606	381	33,871	.63	56
	Burn	1940-44	210	184	47,333	.88	225
	Plantation	1940-44	365	195	42,426	.53	116
	Cutover	1920-39	3,978	4,872	431,721	1.22	109
	Reproduction	1910-39	7,059	7,074	265,808	1.00	38
	Pole		380	378	46,350	.99	122
	Mature		905	621	71,314	.69	79
	Stream		1,986	2,711	210,507	1.37	106
	Total		15,489	16,416	1,149,330	1.06	74

*Roads worked in mature adjacent to reproduction and cutover areas

TABLE 4

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1944
KANIKSU OPERATION

State	Working	Class	Acres	Effective Man-Days	Total Ribes	Per Acre Basis Man-Days	Per Acre Basis Ribes
Idaho	First	EQ-Coop.	322	958	93,554	2.98	291
		FS-Reg.	2,052	1,486	170,508	.72	83
		Total	2,374	2,444	264,062	1.03	111
	Second	EQ-Coop.	264	182	6,365	.69	24
		FS-Reg.	3,956	4,375	197,655	1.11	50
		Total	4,220	4,557	204,020	1.08	48
	Third	EQ-Coop.	1,982	2,479	183,835	1.25	93
		FS-Reg.	716	747	9,051	1.04	13
		Total	2,698	3,226	192,886	1.20	71
	All Workings	EQ-Coop.	2,568	3,619	283,754	1.41	110
		FS-Reg.	6,724	6,608	377,214	.98	56
		Total	9,292	10,227	660,968	1.10	71
Washington	First	FS-Reg.	757	849	178,714	1.12	236
	Second	FS-Reg.	2,553	2,834	202,624	1.11	79
	Third	FS-Reg.	2,887	2,506	107,024	.87	37
	All Workings	FS-Reg.	6,197	6,189	488,362	1.00	79
Idaho and Washington	First	EQ-Coop.	322	958	93,554	2.98	291
		FS-Reg.	2,809	2,335	349,229	.83	124
		Total	3,131	3,293	442,776	1.05	141
	Second	EQ-Coop.	264	182	6,365	.69	24
		FS-Reg.	6,509	7,209	400,279	1.11	61
		Total	6,773	7,391	406,644	1.09	60
	Third	EQ-Coop.	1,982	2,479	183,835	1.25	93
		FS-Reg.	3,603	3,253	116,075	.90	32
		Total	5,585	5,732	299,910	1.03	54
	All Workings	EQ-Coop.	2,568	3,619	283,754	1.41	110
		FS-Reg.	12,921	12,797	865,795	.99	67
		Total	15,489	16,416	1,149,330	1.06	74

TABLE 5

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1944
KANIKSU OPERATION

State	Working	Number of Acres Worked									
		By Forest Service				By Bureau	Total				
							Federal	Other			
		National Forest	State	Private	Total	State	National Forest	State	Private	Total	Total
Idaho	First	1,430		622	2,052	322	1,430	322	622	944	2,374
	Second	3,492	168	296	3,956	264	3,492	432	296	728	4,220
	Third	620		96	716	1,982	620	1,982	96	2,078	2,698
	Total	5,542	168	1,014	6,724	2,568	5,542	2,736	1,014	3,750	9,292
Washington	First	757			757		757				757
	Second	2,399		154	2,553		2,399		154	154	2,553
	Third	2,887			2,887		2,887				2,887
	Total	6,043		154	6,197		6,043		154	154	6,197
Total	First	2,187		622	2,809	322	2,187	322	622	944	3,131
	Second	5,891	168	450	6,509	264	5,891	432	450	882	6,773
	Third	3,507		96	3,603	1,982	3,507	1,982	96	2,078	5,585
	Total	11,585	168	1,168	12,921	2,568	11,585	2,736	1,168	3,904	15,489

TABLE 6

TOTAL RIBES BY SPECIES ERADICATED, 1944
KANIKSU OPERATION

Working	Eradication Type	Acres	Ribes by Species			Total Ribes
			Ribes lacustre	Ribes viscosissimum	Ribes inerme	
First	Cutover (1940-44)	606	18,073	15,798		33,871
	Burn (1940-44)	210	18,015	29,318		47,333
	Plantation (1940-44)	365	1,725	40,701		42,426
	Cutover (1920-39)	1,428	27,517	171,919	2,879	202,315
	Reproduction (1910-39)	348	62,242	45,178		107,420
	Mature	170	7,241	486		7,727
	Stream	4	1,684			1,684
	All Types	3,131	136,497	303,400	2,879	442,776
Second	Cutover (1920-39)	786	32,393	20,671	100	53,164
	Reproduction (1910-39)	3,497	56,418	32,966	3,702	93,086
	Pole	241	12,349	32,966		45,315
	Mature	536	8,228	4,954	207	13,389
	Stream	1,713	128,111	22,718	50,861	201,690
	All Types	6,773	237,499	114,275	54,870	406,644
Third	Cutover (1920-39)	1,764	102,241	74,001		176,242
	Reproduction (1910-39)	3,214	34,831	30,248	223	65,302
	Pole	139	1,029	6		1,035
	Mature	199	4,673	45,525		50,198
	Stream	269	6,192	119	822	7,133
	All Types	5,585	148,966	149,899	1,045	299,910
All Workings	Cutover (1940-44)	606	18,073	15,798		33,871
	Burn (1940-44)	210	18,015	29,318		47,333
	Plantation (1940-44)	365	1,725	40,701		42,426
	Cutover (1920-39)	3,978	162,151	266,591	2,979	431,721
	Reproduction (1910-39)	7,059	153,491	108,392	3,925	265,808
	Pole	380	13,378	32,972		46,350
	Mature	905	20,142	50,965	207	71,314
	Stream	1,986	136,987	22,837	51,683	210,507
	All Types	15,489	522,962	567,574	58,794	1,149,330

TABLE 7

SUMMARY OF RIBES ERADICATION, 1923-1944
KANIKSU OPERATION

Working	Eradication Type	Year of Origin	Gross Acres Worked	Man-Days	Ribes Destroyed	Per Acre Man-Days	Per Acre Ribes	Net Acreage Remaining Worked	Net Acreage Remaining Unworked
First	Cutover	1940-44	1,454	872	82,243	.60	57	1,454	39,080
	Burn	1940-44	210	184	47,333	.88	225	210	
	Plantation	1940-44	2,631	1,317	490,404	.50	186	2,631	
	Cutover	1920-39	9,852	6,842	1,666,648	.69	169	9,278	26,701
	Reproduction	1910-39	164,264	115,513	31,681,249	.70	193	157,645	27,952
	Pole		122,029	42,516	6,020,274	.35	49	120,714	31,794
	Mature		141,985	30,312	5,783,074	.21	41	114,690	43,585
	Miscellaneous		6,735	3,477	1,440,503	.52	214	5,372	2,172
	Stream		22,214	48,895	9,160,871	2.20	412	21,570	7,602
	Total		471,374	249,928	56,372,599	.53	120	433,564	178,886
Second	Cutover	1920-39	6,026	7,856	1,700,651	1.30	282	6,026	
	Reproduction	1910-39	42,127	37,071	5,161,581	.88	123	41,219	
	Pole		17,667	8,747	667,715	.50	38	17,667	
	Mature		6,075	3,220	338,524	.53	56	6,075	
	Miscellaneous		808	386	41,065	.48	51	808	
	Stream		7,019	10,859	1,168,715	1.55	167	6,964	
	Total		79,722	68,139	9,078,251	.85	114	78,759	
Third	Cutover	1920-39	1,904	2,186	190,412	1.15	100	1,904	
	Reproduction	1910-39	11,767	12,324	1,045,815	1.05	89	11,767	
	Pole		614	225	20,964	.37	34	614	
	Mature		304	270	51,582	.89	170	304	
	Miscellaneous		179	122	3,026	.68	17	179	
	Stream		1,040	1,351	60,880	1.30	59	1,040	
	Total		15,808	16,478	1,372,679	1.04	87	15,808	
All Workings	Cutover	1940-44	1,454	872	82,243	.60	57	1,454	39,080
	Burn	1940-44	210	184	47,333	.88	225	210	
	Plantation	1940-44	2,631	1,317	490,404	.50	186	2,631	
	Cutover	1920-39	17,782	16,884	3,557,711	.95	200	17,208	26,701
	Reproduction	1910-39	218,158	164,908	37,888,645	.76	174	210,631	27,952
	Pole		140,310	51,488	6,708,953	.37	48	138,995	31,794
	Mature		148,364	33,802	6,173,180	.23	42	121,069	43,585
	Miscellaneous		7,722	3,985	1,484,594	.52	192	6,359	2,172
	Stream		30,273	61,105	10,390,466	2.02	343	29,574	7,602
	Total		566,904	334,545	66,823,529	.59	118	528,131	178,886

TABLE 8

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1923-1944
KANIKSU OPERATION

State	Class	Gross Acres	Effective Man-Days	Total Ribes	Per Acre Basis Man-Days	Per Acre Basis Ribes
Idaho	EQ-Reg.	18,796	6,844	1,066,689	.36	57
	EQ-Coop.	125,445	45,166	10,637,809	.36	85
	EQ-Emerg.	99,041	68,851	11,333,497	.70	114
	FS-Reg.	37,940	37,542	4,470,744	.99	118
	FS-Emerg.	99,269	38,823	8,788,474	.39	89
	CCC	62,419	50,478	8,451,835	.81	135
	Total	442,910	247,704	44,749,048	.56	101
Washington	EQ-Emerg.	31,629	19,288	6,754,071	.61	214
	FS-Reg.	33,671	28,462	7,819,917	.85	232
	FS-Emerg.	36,366	14,386	4,013,260	.40	110
	CCC	22,328	24,705	3,487,233	1.11	156
	Total	123,994	86,841	22,074,481	.70	178
Idaho and Washington	EQ-Reg.	18,796	6,844	1,066,689	.36	57
	EQ-Coop.	125,445	45,166	10,637,809	.36	85
	EQ-Emerg.	130,670	88,139	18,087,568	.67	138
	FS-Reg.	71,611	66,004	12,290,661	.92	172
	FS-Emerg.	135,635	53,209	12,801,734	.39	94
	CCC	84,747	75,183	11,939,068	.89	141
	Total	566,904	334,545	66,823,529	.59	118

TABLE 9

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1923-1944
KANIKSU OPERATION

State	Working	Net Acres Worked in Control Area: Federal: National Forest	Federal: Public Domain	Federal: Total	Other: State	Other: Private	Other: Total	Total
Idaho	First	176,138	54	176,192	104,781	64,780	169,561	345,753
	Second	34,500		34,500	16,554	9,489	26,043	60,543
	Third	2,095		2,095	7,714	1,208	8,922	11,017
	Total	212,733	54	212,787	129,049	75,477	204,526	417,313
Washington	First	80,948		80,948	2,080	4,783	6,863	87,811
	Second	17,118		17,118		1,098	1,098	18,216
	Third	4,599		4,599		192	192	4,791
	Total	102,665		102,665	2,080	6,073	8,153	110,818
Idaho and Washington	First	257,086	54	257,140	106,861	69,563	176,424	433,564
	Second	51,618		51,618	16,554	10,587	27,141	78,759
	Third	6,694		6,694	7,714	1,400	9,114	15,808
	Total	315,398	54	315,452	131,129	81,550	212,679	528,131

TABLE 10

PROGRESS OF FIRST WORKING BY OWNERSHIP CLASSES, 1923-1944
KANIKSU OPERATION

State	Ownership Class	Net Acres in Control Area		
		Worked	Unworked	Total
Idaho	National Forest	176,138	59,571	235,709
	Public Domain	54	80	134
	Subtotal Federal	176,192	59,651	235,843
	State	104,781	30,256	135,037
	Private	64,780	45,307	110,087
	Subtotal Other	169,561	75,563	245,124
	Total	345,753	135,214	480,967
Washington	National Forest	80,948	39,700	120,648
	State	2,080		2,080
	Private	4,783	3,972	8,755
	Subtotal Other	6,863	3,972	10,835
	Total	87,811	43,672	131,483
Washington and Idaho	National Forest	257,086	99,271	356,357
	Public Domain	54	80	134
	Subtotal Federal	257,140	99,351	356,491
	State	106,861	30,256	137,117
	Private	69,563	49,279	118,842
	Subtotal Other	176,424	79,535	255,959
	Total	433,564	178,886	612,450

TABLE 11

TOTAL RIBES BY SPECIES ERADICATED, 1923-1944
KANIKSU OPERATION

Working	Eradication Type	Gross Acres	Ribes by Species					Total Ribes
			Ribes lacustre	Ribes viscosissimum	Ribes inerme	Ribes irriguum	Ribes acerifolium	
First	Cutover (1940-44)	1,454	45,670	36,573				82,243
	Burn (1940-44)	210	18,015	29,318				47,333
	Plantation (1940-44)	2,631	72,450	417,954				490,404
	Cutover (1920-39)	9,852	651,755	967,010	47,883			1,666,648
	Reproduction (1910-39)	164,264	9,302,481	22,149,719	226,102	2,947		31,681,249
	Pole	122,029	2,884,265	2,901,946	208,435	21,714	3,914	6,020,274
	Mature	141,985	4,011,599	1,614,889	154,559		2,027	5,783,074
	Miscellaneous	6,735	338,295	1,033,671	68,537			1,440,503
	Stream	22,214	4,860,832	425,512	3,854,943		19,584	9,160,871
	All Types	471,374	22,185,362	29,576,592	4,560,459	24,661	25,525	56,372,599
Second	Cutover (1920-39)	6,026	359,392	1,327,311	13,948			1,700,651
	Reproduction (1910-39)	42,127	1,491,718	3,634,652	35,211			5,161,581
	Pole	17,667	314,269	342,303	11,143			667,715
	Mature	6,075	172,318	162,125	4,081			338,524
	Miscellaneous	808	24,827	15,363	875			41,065
	Stream	7,019	639,534	73,739	455,442			1,168,715
	All Types	79,722	3,002,058	5,555,493	520,700			9,078,251
Third	Cutover (1920-39)	1,904	104,670	80,741	5,001			190,412
	Reproduction (1910-39)	11,767	306,869	736,315	2,631			1,045,815
	Pole	614	7,307	13,532	125			20,964
	Mature	304	5,386	46,196				51,582
	Miscellaneous	179	1,109	1,893	24			3,026
	Stream	1,040	45,469	4,209	11,202			60,880
	All Types	15,808	470,810	882,886	18,983			1,372,679
All Workings	Cutover (1940-44)	1,454	45,670	36,573				82,243
	Burn (1940-44)	210	18,015	29,318				47,333
	Plantation (1940-44)	2,631	72,450	417,954				490,404
	Cutover (1920-39)	17,782	1,115,817	2,375,062	66,832			3,557,711
	Reproduction (1910-39)	218,158	11,101,068	26,520,686	263,944	2,947		37,888,645
	Pole	140,310	3,205,841	3,257,781	219,703	21,714	3,914	6,708,953
	Mature	148,364	4,189,303	1,823,210	158,640		2,027	6,173,180
	Miscellaneous	7,722	364,231	1,050,927	69,436			1,484,594
	Stream	30,273	5,545,835	503,460	4,321,587		19,584	10,390,466
	All Types	566,904	25,658,230	36,014,971	5,100,142	24,661	25,525	66,823,529

BLISTER RUST CONTROL WORK, MONTANA OPERATION, 1944

By
A. S. Skoglund, Operation Supervisor

INTRODUCTION

Blister rust control activities on the Montana operation were conducted on both the Cabinet and Kootenai National Forests.

A total of 5,985 acres were worked in 1944 which brings the net progress for the Montana operation to 129,166 acres worked initially and 14,692 acres reworked. Approximately 74,187 acres are in need of initial ribes eradication.

ORGANIZATION AND ADMINISTRATION

The Forest Service was responsible for the administration and maintenance of the camps and technical supervision was provided by the Bureau of Entomology and Plant Quarantine. The field organization was directed by A.S. Skoglund.

Two camps were operated on the Cabinet Forest with a peak of 122 employed. The first camp was established at Bull River Ranger Station on April 19. The second camp was located at Noxon Ranger Station and was established on June 1. One camp of 76 workers was established during May and located on the shores of Spar Lake in the Kootenai Forest. All of the camps were closed the last week of August.

LOCATION AND DESCRIPTION OF AREAS

In the Cabinet Forest work was performed in the Bull River drainage and in and near Noxon, Montana. Initial work was given the Snake Creek area which is a thrifty 55-year old white pine stand relatively light in ribes. Several snowslides in 1936 on the East Fork of Bull River created an area containing thousands of ribes per acre in what was previously a relatively ribes-free pole stand. Initial work was performed on this area.

Rework was performed on Star Gulch, Carmichael Gulch and all the major stream type along Bull River. The upland ribes were mainly Ribes viscosissimum whereas mostly R. inerme were removed in the stream type. All of the above work is included in secs. 32 and 34 of T. 28 N., R. 32 W.; secs. 32 and 33 of T. 28 N., R. 33 W.; secs. 2, 3, 4, 5, 6, 7, 8, 10, 11, 12 and 18 of T. 27 N., R. 32 W.; sections 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14 and 15 of T. 27 N., R. 33 W.

Initial work in and around Noxon and Heron was performed in 55-year old stands of white pine relatively light in ribes and infection. Work performed in Rock Creek was a continuation of that started in 1943 and consisted of both initial and rework. This work is included in secs. 19 and 33 of T. 26 N., R. 32 W., secs. 23, 24 and 25 of T. 26 N., R. 33 W.; secs. 34 and 35 of T. 27 N., R. 34 W.

Work in the Kootenai Forest was confined mostly to the area in the vicinity of Spar Lake. This area is mainly composed of a 55-year old stand of thrifty pole light in ribes with only a small amount of infection. The rim above the pole is of mature type with some heavy concentrations of ribes. Several small precipitous drainages west of the lake contained very heavy concentrations of ribes difficult to remove. The entire area represents some of the most rugged topography in the control area. These workings are located in secs. 15, 16, 17, 20, 21, 27, 28 and 33 of T. 29 N., R. 34 W.

A small amount of work was performed in secs. 5 and 6 of T. 29 N., R. 33 W. This area was cut in 1939 and R. irriguum have germinated throughout the area.

METHODS AND EQUIPMENT

The same methods and procedures were used as last year. Each area and to some extent each crew must be analyzed and various procedures and methods applied in order to effect the greatest accomplishment.

Special training was given to selected boys in order to help develop and prepare them for more responsible jobs. Three boys were thus trained to prepare them as straw bosses for next season and four boys were trained as checkers.

CHECKING

A regular four percent check was performed on all upland areas worked this past season. Portions of areas that did not meet efficiency standards were then reworked but not rechecked. Economic as well as ecological factors must be considered in applying and interpreting checks performed on small rework areas. A post check supplemented by a disease survey will be applied to these and surrounding areas as soon as an effective check can be performed. Two checkers performed all the regular check this past season, assisted by four boys selected and trained during August as checkers for 1945.

SURVEYS AND CONTROL STATUS

The status of control in the Cabinet Forest is practically the same as last year. There have been 78,401 acres initially worked in the net control area of which 42,981 acres are on maintenance, 13,655 acres are on post check and 21,765 acres are to be reworked. There remain 16,244 acres to be initially worked.

A check was made of the transplant and seedling stock in the nursery beds at Savenac. One hundred fifty infected specimens were found in a check of 18,000 samples of 2-2 transplant stock sown in the fall of 1939 and transplanted in 1942. This represents .83 percent infection. An inspection of 8,000 specimens of two-year old seedling stock sown in the fall of 1942 disclosed one infected seedling. This inspection of the seedling stock may give us the first positive check on a source of inoculum and the effectiveness of control by removal of the ribes from Haugan Lookout. These pine seedlings are the first

ones germinated since the removal of 3,000 ribes per acre from Haugan Lookout.

Seedling stock is to be transplanted this coming season to the old nursery along Savenac Creek. This will necessitate a reworking of the stream type and spraying of the masses of R. petiolare one mile upstream from the nursery beds.

A check of the upper plantation on the middle fork of Big Creek revealed scattering new infection especially near the upper end. The control boundary should be extended five to twenty chains to the ridge to prevent this infiltration of spores from the ribes on the higher slopes.

The status of control in the Kootenai Forest has changed considerably during the past several years. There have been 50,765 acres initially worked in the net control area of which 27,742 acres are on maintenance, 13,310 acres are on post check and 9,713 acres to be reworked. There remain 57,943 acres to be worked of which 10,864 acres are in cutover type.

Extensive logging operations have reduced the mature stands with relatively light ribes to cutover type of varying ribes conditions. Star, Ruby, Keeler, Stanley and Lake Creek areas have recently been logged or are now being logged. These operations involve the shifting of 9,616 acres of mature type to that of cutover.

A part of the Star Creek sale was broadcast burned in 1942 and will be planted during 1945. This area supports about 25 ribes per acre and should be initially worked next summer prior to telial production.

The lower portion of the North Fork of Keeler Creek area has been logged but as yet there has not been much reseeding of either pine or ribes. It appears that initial working of this cutover type may be postponed until the entire area has been logged.

The lower Stanley Creek sale area has had a fire which has left the area in an unproductive state. This is a likely unit for a hazard reduction operation followed by planting.

Several centers of pine infection of 1938 origin have been found in the Lake Creek cutover area. This area should be worked this coming season to prevent any intensification or spread.

Occasional cankers were found this past season in and around Spar Lake though most of them were in the draws and near the streams. Ribes eradication work performed this year should suffice to afford permanent protection to the pole stand in Hiatt Creek.

Three new areas, Barren, Bristow and Burnt Creeks, have been added to the blister rust control unit. The mature trees in Barren Creek are being logged by the shelterwood method and it is planned to protect the residual pole and

reproduction that will remain for the second cutting. Present conditions indicate that most of the work will occur along the streams, roads, skid trails and landings. The lower portion of Bristow Creek supports a stringer of white pine pole with light ribes. The upper portion of Bristow Creek is being selectively logged by the seed tree method of the white pine and spruce. These two drainages represent a compact management unit that can be protected from blister rust at a nominal cost.

The Burnt Creek area is one of 45 to 50-year old white pine pole with working conditions being not too difficult. An occasional canker was found in the upper stream zones which represent the most difficult eradication sites as well as most optimum conditions for spread of pine infection. An advance survey and some work should be performed in this area next season.

During the past two seasons the control areas have been classified in order to better determine their status relative to control and pine producing capacities. As a result of this survey certain areas which had been worked were dropped from the control area as not warranting additional expenditures. Also, several mature areas which had been worked have subsequently been logged and are now classed as unworked cutover type.

This year, in order to present a better analysis of actual progress in accomplishing control, a distinction has been made between gross acres and net acres. Henceforth, gross acres shall refer to total acres worked in each type, including those dropped from the control area or logged, whereas net acres shall refer to the actual amounts of each type now remaining in the control area. These changes make it possible to present amounts of acres by types worked or unworked in the control area. A total of 2,923 acres of worked mature type have been logged and are now classified as unworked cutover. A total of 1,121 acres of various types have been dropped from the control area in the Cabinet Forest because of fires, blister rust damage, non-white pine regeneration, etc.

STATEMENT OF EXPENDITURES AND COSTS

The statement of expenditures and costs by cooperative agency and type of appropriation is shown in the following tabulations:

TABLE 1

EXPENDITURES BY APPROPRIATIONS, CALENDAR YEAR 1944
MONTANA OPERATION

Cooperating Agency	Appropriation	Amount
Bureau of Entomology and Plant Quarantine	Regular BLR-1-4	$ 2,630.75
Forest Service	Regular BLR-4	71,735.78
Total		$74,366.53

TABLE 2

CLASSIFIED EXPENDITURES, CALENDAR YEAR 1944
MONTANA OPERATION

Item	Bureau of Entomology and Plant Quarantine	Forest Service	Total
	Regular BLR-1-4	Regular BLR-4	
Sal., perm. men	$2,241.48	$ 2,861.78	$ 5,103.26
Wages, temp. labs.		52,523.00	$52,523.00
Subs. supplies		$11,907.00	11,907.00
Equipment		2,397.00	2,397.00
Travel and transp.	382.03	994.00	1,376.03
Other supplies	7.24	1,053.00	1,060.24
Total	$2,630.75	$71,735.78	$74,366.53

TABLE 3

SUMMARY OF RIBES ERADICATION, 1944
MONTANA OPERATION

Forest	Working	Eradication Type	Year of Origin	Acres Worked	Man-Days	Ribes Destroyed	Per Acre Man-Days	Per Acre Ribes
Kootenai	First	Cutover	1920-39	44	18	574	.41	13
		Reproduction	1910-39	145	81	2,906	.56	20
		Pole		1,186	623	39,653	.53	33
		Mature		772	828	112,439	1.07	146
		Stream		179	969	119,301	5.41	666
		Total		2,326	2,519	274,873	1.08	118
Cabinet	First	Reproduction	1910-39	136	781	43,291	5.74	318
		Pole		1,898	61	3,798	.03	2
		Miscellaneous		282	5	95	.02	1
		Stream		42	221	28,684	5.26	683
		Total		2,358	1,068	75,868	.45	32
	Second	Reproduction	1910-39	105	562	31,744	5.35	302
		Pole		325	673	12,292	2.07	38
		Mature		16	12	343	.75	21
		Miscellaneous		33	34	1,503	1.03	46
		Stream		606	1,532	59,018	2.53	97
		Total		1,085	2,813	104,900	2.59	97
	Third	Pole		75	50	1,390	.67	19
		Stream		141	363	20,208	2.57	143
		Total		216	413	21,598	1.91	100
	All Workings	Reproduction	1910-39	241	1,343	75,035	5.57	311
		Pole		2,298	784	17,480	.34	8
		Mature		16	12	343	.75	21
		Miscellaneous		315	39	1,598	.12	5
		Stream		789	2,116	107,910	2.68	137
		Total		3,659	4,294	202,366	1.17	55
All Forests	First	Cutover	1920-39	44	18	574	.41	13
		Reproduction	1910-39	281	862	46,197	3.07	164
		Pole		3,084	684	43,451	.22	14
		Mature		772	828	112,439	1.07	146
		Miscellaneous		282	5	95	.02	1
		Stream		221	1,190	147,985	5.38	670
		Total		4,684	3,587	350,741	.77	75
	Second	Reproduction	1910-39	105	562	31,744	5.35	302
		Pole		325	673	12,292	2.07	38
		Mature		16	12	343	.75	21
		Miscellaneous		33	34	1,503	1.03	46
		Stream		606	1,532	59,018	2.53	97
		Total		1,085	2,813	104,900	2.59	97
	Third	Pole		75	50	1,390	.67	19
		Stream		141	363	20,208	2.57	143
		Total		216	413	21,598	1.91	100
	All Workings	Cutover	1920-39	44	18	574	.41	13
		Reproduction	1910-39	386	1,424	77,941	3.69	202
		Pole		3,484	1,407	57,133	.40	16
		Mature		788	840	112,782	1.07	143
		Miscellaneous		315	39	1,598	.12	5
		Stream		968	3,085	227,211	3.19	235
		Total		5,985	6,813	477,239	1.14	80

TABLE 4

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1944
MONTANA OPERATION

Forest	Working	Number of Acres Worked by Forest Service: National Forest	Private	Total
Kootenai	First	2,282	44	2,326
Cabinet	First	729	1,629	2,358
	Second	733	352	1,085
	Third	39	177	216
	Total	1,501	2,158	3,659
All Forests	First	3,011	1,673	4,684
	Second	733	352	1,085
	Third	39	177	216
	Total	3,783	2,202	5,985

TABLE 5

TOTAL RIBES BY SPECIES ERADICATED, 1944
MONTANA OPERATION

Forest	Working	Eradication Type	Acres	Ribes by Species					Total Ribes
				Ribes lacustre	Ribes viscosissimum	Ribes inerme	Ribes irriguum	Ribes coloradense	
Kootenai	First	Cutover (1920-39)	44	403	2	72	97		574
		Reproduction (1910-39)	145	2,810	33			63	2,906
		Pole	1,186	29,650	9,701			302	39,653
		Mature	772	111,106	1,333				112,439
		Stream	179	117,224	877			1,200	119,301
		Total	2,326	261,193	11,946	72	97	1,565	274,873
Cabinet	First	Reproduction (1910-39)	136	39,371	3,737	183			43,291
		Pole	1,898	1,247		2,551			3,798
		Miscellaneous	282	95					95
		Stream	42	6,267	737	21,680			28,684
		Total	2,358	46,980	4,474	24,414			75,868
	Second	Reproduction (1910-39)	105	16,346	15,398				31,744
		Pole	325	5,944	6,348				12,292
		Mature	16	343					343
		Miscellaneous	33	877	626				1,503
		Stream	606	29,392	863	28,763			59,018
		Total	1,085	52,902	23,235	28,763			104,900
	Third	Pole	75	730		660			1,390
		Stream	141	4,590	112	15,506			20,208
		Total	216	5,320	112	16,166			21,598
	All Workings	Reproduction (1910-39)	241	55,717	19,135	183			75,035
		Pole	2,298	7,921	6,348	3,211			17,480
		Mature	16	343					343
		Miscellaneous	315	972	626				1,598
		Stream	789	40,249	1,712	65,949			107,910
		Total	3,659	105,202	27,821	69,343			202,366
All Forests	First	Cutover (1920-39)	44	403	2	72	97		574
		Reproduction (1910-39)	281	42,181	3,770	183		63	46,197
		Pole	3,084	30,897	9,701	2,551		302	43,451
		Mature	772	111,106	1,333				112,439
		Miscellaneous	282	95					95
		Stream	221	123,491	1,614	21,680		1,200	147,985
		Total	4,684	308,173	16,420	24,486	97	1,565	350,741
	Second	Reproduction (1910-39)	105	16,346	15,398				31,744
		Pole	325	5,944	6,348				12,292
		Mature	16	343					343
		Miscellaneous	33	877	626				1,503
		Stream	606	29,392	863	28,763			59,018
		Total	1,085	52,902	23,235	28,763			104,900
	Third	Pole	75	730		660			1,390
		Stream	141	4,590	112	15,506			20,208
		Total	216	5,320	112	16,166			21,598
	All Workings	Cutover (1920-39)	44	403	2	72	97		574
		Reproduction (1910-39)	386	58,527	19,168	183		63	77,941
		Pole	3,484	37,571	16,049	3,211		302	57,133
		Mature	788	111,449	1,333				112,782
		Miscellaneous	315	972	626				1,598
		Stream	968	157,473	2,589	65,949		1,200	227,211
		Total	5,985	366,395	39,767	69,415	97	1,565	477,239

TABLE 6

SUMMARY OF RIBES ERADICATION, 1928-1944
MONTANA OPERATION

Forest	Working	Eradication Type	Year of Origin	Gross Acres Worked	Man-Days	Ribes Destroyed	Per Acre Man-Days	Per Acre Ribes	Net Acreage Remaining Worked	Net Acreage Remaining Unworked
Kootenai	First	Cutover	1940-44							5,739
		Cutover	1920-39	44	18	574	.41	13	44	5,125
		Reproduction	1910-39	13,164	8,700	1,079,255	.66	82	12,430	10,635
		Pole		20,070	7,846	851,134	.39	42	19,158	19,454
		Mature		16,791	4,367	594,358	.26	35	15,786	16,990
		Miscellaneous		346	95	7,956	.27	23	346	-
		Stream		3,229	9,146	1,333,460	2.83	413	3,001	-
		Total		53,644	30,172	3,866,737	.56	72	50,765	57,943
	Second	Reproduction	1910-39	341	165	25,522	.48	75	341	-
		Pole		779	607	40,490	.78	52	779	-
		Stream		533	805	62,875	1.51	118	305	-
		Total		1,653	1,577	128,887	.95	78	1,425	-
	All Workings	Cutover	1920-39	44	18	574	.41	13	44	-
		Reproduction	1910-39	13,505	8,865	1,104,777	.66	82	12,771	-
		Pole		20,849	8,453	891,624	.41	43	19,937	-
		Mature		16,791	4,367	594,358	.26	35	15,786	-
		Miscellaneous		346	95	7,956	.27	23	346	-
		Stream		3,762	9,951	1,396,335	2.65	371	3,306	-
		Total		55,297	31,749	3,995,624	.57	72	52,190	-
Cabinet	First	Reproduction	1910-39	29,365	29,682	5,616,402	1.01	191	28,796	7,318
		Pole		25,959	9,213	1,745,885	.35	67	25,670	7,134
		Mature		9,297	4,447	1,064,328	.48	114	9,277	1,792
		Miscellaneous		4,900	2,230	596,499	.46	122	4,657	-
		Stream		3,913	13,089	3,008,221	3.35	769	3,913	-
		Total		73,434	58,661	12,031,335	.80	164	72,313	16,244
	Second	Reproduction	1910-39	5,095	7,279	728,027	1.43	143	5,095	-
		Pole		1,108	1,423	101,767	1.28	92	1,108	-
		Mature		28	27	1,799	.96	64	28	-
		Miscellaneous		33	34	1,503	1.03	46	33	-
		Stream		1,991	4,238	248,280	2.13	125	1,991	-
		Total		8,255	13,001	1,081,376	1.57	131	8,255	-
	Third	Reproduction	1910-39	1,092	906	77,575	.83	71	1,092	-
		Pole		125	149	7,256	1.19	58	125	-
		Stream		492	837	68,704	1.70	140	492	-
		Total		1,709	1,892	153,535	1.11	90	1,709	-
	All Workings	Reproduction	1910-39	35,552	37,867	6,422,004	1.07	181	34,983	-
		Pole		27,192	10,785	1,854,908	.40	68	26,903	-
		Mature		9,325	4,474	1,066,127	.48	114	9,305	-
		Miscellaneous		4,933	2,264	598,002	.46	121	4,690	-
		Stream		6,396	18,164	3,325,205	2.84	520	6,396	-
		Total		83,398	73,554	13,266,246	.88	159	82,277	-
Savenac Nursery	First	Reproduction	1910-39	5,000	1,688	521,650	.34	104	5,000	0
		Stream		1,088	2,655	583,169	2.44	536	1,088	0
		Total		6,088	4,343	1,104,819	.71	181	6,088	0
	Second	Reproduction	1910-39	179	186	34,173	1.04	191	179	-
		Stream		999	1,157	310,073	1.16	310	999	-
		Total		1,178	1,343	344,246	1.14	292	1,178	-
	Third and Other	Reproduction	1910-39	85	70	4,079	.82	48	85	-
		Stream		2,040	2,163	83,579	1.06	41	2,040	-
		Total		2,125	2,233	87,658	1.05	41	2,125	-
	All Workings	Reproduction	1910-39	5,264	1,944	559,902	.37	106	5,264	-
		Stream		4,127	5,975	976,821	1.45	237	4,127	-
		Total		9,391	7,919	1,536,723	.84	164	9,391	-
All Forests	First	Cutover	1940-44							5,739
		Cutover	1920-39	44	18	574	.41	13	44	5,125
		Reproduction	1910-39	47,529	40,070	7,217,307	.84	152	46,226	17,953
		Pole		46,029	17,059	2,597,019	.37	56	44,828	26,588
		Mature		26,088	8,814	1,658,686	.34	64	25,063	18,782
		Miscellaneous		5,246	2,325	604,455	.44	115	5,003	-
		Stream (1)		8,230	24,890	4,924,850	3.02	598	8,002	-
		Total		133,166	93,176	17,002,891	.70	128	129,166	74,187
	Second	Reproduction	1910-39	5,615	7,630	787,722	1.36	140	5,615	-
		Pole		1,887	2,030	142,257	1.08	75	1,887	-
		Mature		28	27	1,799	.96	64	28	-
		Miscellaneous		33	34	1,503	1.03	46	33	-
		Stream (2)		3,523	6,200	621,228	1.76	176	3,295	-
		Total		11,086	15,921	1,554,509	1.44	140	10,858	-
	Third and Other	Reproduction	1910-39	1,177	976	81,654	.83	69	1,177	-
		Pole		125	149	7,256	1.19	58	125	-
		Stream (3)		2,532	3,000	152,283	1.18	60	2,532	-
		Total		3,834	4,125	241,193	1.08	63	3,834	-
	All Workings	Cutover	1940-44							5,739
		Cutover	1920-39	44	18	574	.41	13	44	5,125
		Reproduction	1910-39	54,321	48,676	8,086,683	.90	149	53,018	17,953
		Pole		48,041	19,238	2,746,532	.40	57	46,840	26,588
		Mature		26,116	8,841	1,660,485	.34	64	25,091	18,782
		Miscellaneous		5,279	2,359	605,958	.45	115	5,036	-
		Stream (4)		14,285	34,090	5,698,361	2.39	399	13,829	-
		Total		148,086	113,222	18,798,593	.76	127	143,858	74,187

Chemical work included above:

	Acres	Man-Days	Gallons Spray
(1)	704	1,957	57,825
(2)	178	379	11,146
(3)	12	148	3,545
(4)	894	2,484	72,516

TABLE 7

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1928-1944
MONTANA OPERATION

Class	Gross Acres	Effective Man-Days	Ribes Destroyed	Gallons Spray	Per Acre Basis	
					Man-Days	Ribes
EQ-Reg.	2,002	3,295	761,710	34,795	1.65	380
EQ-Emergency	66,076	30,787	5,775,415	1,330	.47	87
FS-Reg.	29,821	31,080	3,421,736	8,428	1.04	115
FS-Emergency	35,712	35,620	7,367,723	21,638	1.00	206
CCC	14,475	12,440	1,472,009	6,325	.86	102
Total	148,086	113,222	18,798,593	72,516	.76	127

TABLE 8

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1928-1944
MONTANA OPERATION

Forest	Working	Net Acres Worked in Control Area						
		Federal			Other			Total
		National Forest	Public Domain	Total	State	Private	Total	
Kootenai	First	48,567		48,567		2,198	2,198	50,765
	Second	1,165		1,165		260	260	1,425
	Total	49,732		49,732		2,458	2,458	52,190
Cabinet	First	61,542	40	61,582	734	16,085	16,819	78,401
	Second	7,512		7,512	1	1,920	1,921	9,433
	Third	2,283		2,283		1,551	1,551	3,834
	Total	71,337	40	71,377	735	19,556	20,291	91,668
All Forests	First	110,109	40	110,149	734	18,283	19,017	129,166
	Second	8,677		8,677	1	2,180	2,181	10,858
	Third	2,283		2,283		1,551	1,551	3,834
	Total	121,069	40	121,109	735	22,014	22,749	143,858

TABLE 9

PROGRESS OF FIRST WORKING BY OWNERSHIP CLASSES, 1928-1944
MONTANA OPERATION

Forest	Ownership Class	Net Acres in Control Area		
		Worked	Unworked	Total
Kootenai	National Forest	48,567	45,790	94,357
	State-Montana		173	173
	Private	2,198	11,980	14,178
	Subtotal Other	2,198	12,153	14,351
	Total	50,765	57,943	108,708
Cabinet	National Forest	61,542	12,052	73,594
	Public Domain	40		40
	Subtotal Federal	61,582	12,052	73,634
	State	734		734
	Private	16,085	4,192	20,277
	Subtotal Other	16,819	4,192	21,011
	Total	78,401	16,244	94,645
All Forests	National Forest	110,109	57,842	167,951
	Public Domain	40		40
	Subtotal Federal	110,149	57,842	167,991
	State	734	173	907
	Private	18,283	16,172	34,455
	Subtotal Other	19,017	16,345	35,362
	Total	129,166	74,187	203,353

TABLE 10

TOTAL RIBES BY SPECIES ERADICATED, 1928-1944
MONTANA OPERATION

Working	Eradication Type	Gross Acres	Ribes by Species							Total Ribes
			Ribes lacustre	Ribes viscosissimum	Ribes petiolare	Ribes inerme	Ribes irriguum	Ribes coloradense	Ribes triste	
First	Cutover (1920-39)	44	403	2		72	97			574
	Reproduction (1910-39)	47,529	3,396,335	3,641,041	4,714	55,752	114,802	3,518	1,145	7,217,307
	Pole	46,029	1,456,332	952,091	200	103,756	84,338	302		2,597,019
	Mature	26,088	1,452,632	178,729	259	11,080	8,729	7,257		1,658,686
	Miscellaneous	5,246	291,724	295,188		12,381	5,162			604,455
	Stream	8,230	3,162,771	119,767	266,006	1,316,334	5,744	33,105	21,123	4,924,850
	Total	133,166	9,760,197	5,186,818	271,179	1,499,375	218,872	44,182	22,268	17,002,891
Second	Reproduction (1910-39)	5,615	462,752	302,185	4,860	4,668	10,666		2,591	787,722
	Pole	1,887	104,166	30,632	119	6,419	921			142,257
	Mature	28	1,799							1,799
	Miscellaneous	33	877	626						1,503
	Stream	3,523	195,589	5,776	48,208	352,846	10,975		7,834	621,228
	Total	11,086	765,183	339,219	53,187	363,933	22,562		10,425	1,554,509
Third	Reproduction (1910-39)	1,177	47,600	33,647	93		200		114	81,654
	Pole	125	1,530	5,060		660	6			7,256
	Stream	2,532	22,422	451	35,905	77,763			15,742	152,283
	Total	3,834	71,552	39,158	35,998	78,423	206		15,856	241,193
All Workings	Cutover (1920-39)	44	403	2		72	97			574
	Reproduction (1910-39)	54,321	3,906,687	3,976,873	9,667	60,420	125,668	3,518	3,850	8,086,683
	Pole	48,041	1,562,028	987,783	319	110,835	85,265	302		2,746,532
	Mature	26,116	1,454,431	178,729	259	11,080	8,729	7,257		1,660,485
	Miscellaneous	5,279	292,601	295,814		12,381	5,162			605,958
	Stream	14,285	3,380,782	125,994	350,119	1,746,943	16,719	33,105	44,699	5,698,361
	Total	148,086	10,596,932	5,565,195	360,364	1,941,731	241,640	44,182	48,549	18,798,593

BLISTER RUST CONTROL, MOUNT RAINIER NATIONAL PARK, 1944

By
M. C. Riley, Operation Supervisor

White pine blister rust control work on Mount Rainier National Park during 1944 was conducted by a maximum crew of 30 men and financed with regular funds. The season extended from June 7 to August 31 and work was done both on ribes eradication and canker elimination on the Longmire and White River areas. Activities started on the Longmire area and the crew moved to White River on July 5. Less time was lost because of inclement weather than for several years and there was less labor turnover than has been previously experienced with youthful workers. The work was supervised by an experienced foreman and an assistant.

Ribes eradication was performed on 289 acres on the Longmire-Silver Forest area and 347 acres on the White River area and consisted entirely of third working. The Silver Forest portion of the Longmire area was worked east of the highway from the east end of the Miller cut-off nearly to Narada Falls and portions of the area north of Canyon Rim were also covered. Stream type was worked on the tributaries of Paradise River which occur in and adjacent to the Silver Forest. This lies in unsurveyed secs. 14, 22, 23 and 24, T. 15 N., R. 8 E., Willamette Meridian. At White River ribes eradication was performed on portions of the area between Rockcrusher Point and Sunrise Point and is located in unsurveyed secs. 31 and 32, T. 17 N., R. 10 E., Willamette Meridian.

No regular strip checks were run on any of the area worked this year because no checker was available. The foreman and his assistant were able to furnish enough close supervision so that it is felt a satisfactory quality of work was performed.

In addition to the ribes eradication work, canker elimination was performed on the Silver Forest and White River areas. This work on the Silver Forest was a continuation of that started in 1943 and completed initial coverage of the white pine area. Canker elimination was performed on 38 acres with an expenditure of 53 man-days, resulting in the inspection of 2,532 trees with 10,283 cankers removed from 1,455 infected trees. At White River the initial canker elimination work was completed to the west end of the white pine area and rework was completed on all of the area previously treated. There were 40,533 trees examined on 1,917 acres in 533 man-days resulting in the removal of 84,433 cankers from 23,166 infected trees.

A representative of the Bureau of Entomology and Plant Quarantine helped plan, organize and supervise the work. The Bureau also supplied the necessary maps, forms, and office supplies for the proper recording and reporting of data.

CONTROL STATUS

Since blister rust control work was started on Mount Rainier National Park in 1930, ribes eradication has been performed on four areas. Two of these,

Starbo and Stevens Canyon, are no longer considered in the control area. The Starbo area was dropped when it was determined that the pine values were not commensurate with the cost of maintaining blister rust control. The Stevens Canyon area was dropped because of the large amount of pine infection present which will result in practically a total loss of the pine. Infection on pine had been found prior to the initiation of ribes eradication work there in 1932. For a number of years it was felt that a high percentage of the white pine could be saved but because of lack of ample appropriations and the insufficient number of workers assigned to the area during the CCC program, when the establishment of side camps presented so many problems, it was not possible to stem the devastation. No work has been performed here since 1941.

On the two remaining areas, Longmire-Silver Forest and White River, which involve a total control area of 3,581 acres, ribes eradication has progressed to the point where the areas are now in a satisfactory condition which can be maintained at a reasonable cost. Blister rust infection was present in the pine on the Longmire-Silver Forest area when control work was initiated in 1930 and was first found on pine on the White River area in 1937 although infected ribes were known to be present in the vicinity prior to any control work. In the course of the last 15 years during all of which time the control program was behind schedule, more than 50 per cent of the pine trees became infected. This condition is not as serious as it might appear since the successive reductions in ribes had greatly retarded the intensity of spread of infection from ribes to pine and the number of cankers per tree was relatively small with only a few of the cankers being damaging. The cankers removed thus far are an accumulation of a number of years' infection when there were many more ribes present than is now the case. On the Longmire portion of the area not a single tree has been lost thus far and a total of only about 12 small trees on the Silver Forest portion and at White River had to be removed because of killing cankers.

While the control status on these areas is approaching a maintenance basis, the removal of significant numbers of ribes is all too recent to permit making accurate estimates of what follow-up work might be involved, yet it is now possible to foresee what will be required and outline within reasonable limits what the future control program on these areas should involve.

RECOMMENDATIONS

The following estimates are based upon ground conditions as they now exist and naturally cannot take into consideration any ground disturbances such as those caused by fire, erosion, floods which change stream courses, road or trail construction and landscaping activities, all of which induce germination of ribes seed.

Longmire-Silver Forest. In 1945 a 25-man field crew for a period of three months is needed to rework stream type at Longmire and along Nisqually and Paradise Creeks and portions of the upland in the Silver Forest. No further

work will be required for three years if the programmed work for 1945 is completed. The maximum future requirements would involve one more complete reworking of the upland and stream types which would require a 25-man crew for three months, plus periodic checking and reworking where necessary in stream type. At this time, 1948 appears to be the logical time to perform this work, the actual extent of which should be determined by an intensive ribes check and disease survey in 1947. After 1948, no further work should be required in the upland types except where disturbances have occurred. The principal problem in maintaining a ribes-free condition occurs in stream type where ribes were originally found in great numbers. The recurrence of ribes seedlings adjacent to streams has been particularly troublesome but the number found in 1944 as compared with those encountered in 1943 indicates that this condition is becoming less of a factor. A periodic check-up and reworking, if necessary, should be done in stream type every five years. It is estimated that a 15-man crew for the year in which the work would be done would be sufficient. It is expected that after about two of these periodic workings in stream type the interval could be extended. With the ribes well suppressed, it is deemed advisable to minimize the damage which may result from infection present in the pine by supplementing any future ribes eradication work with a program of canker elimination. A total of 202 man-days have been used on this work in the past to remove visible cankers. It is reasonable to estimate this work would not involve more than 300 additional man-days over the next ten-year period.

White River. Under normal conditions of rust spread and with no ground disturbances the suppression of ribes on the White River area has reached a maintenance status. The 347 acres reworked in 1944 which had not received satisfactory workings under the CCC program represented the acreage which did not meet control standards. A thorough coverage was made and only 8 ribes per acre were found and these were in localized spots. Both upland and stream type are in good condition. For the protection of the western white pine at the lower elevations and at White River camp ground very little maintenance work would be required. However, the highly susceptible whitebark pine occurs on a large portion of the area. It has recently been determined that this species of pine will contract the rust under favorable moisture conditions and from highly susceptible ribes such as Ribes bracteosum, both of which conditions exist on Mount Rainier National Park, over greater distances than had previously been realized. This ribes species has been eradicated for a distance of one mile from the whitebark pine on the White River area. In view of this susceptibility of whitebark pine it can also be assumed that under favorable conditions spread of the rust can take place from other ribes species from beyond the quarter mile protection zone which has been established. Thus far on this area it has not been possible to determine what pine infection is a result of long distance spread because, until this year, these trees have been exposed to ribes in close proximity. The following of a more adequate schedule on ribes eradication on the White River area has prevented the loss of pine which has taken place on the Stevens Canyon area. If it develops that infection of the whitebark pine is coming from a long distance it would not be advisable to extend the protection zones because of the tremendous cost involved. The infection caused by local ribes or those at greater distances has

been removed at nominal cost by a program of canker elimination. It is believed that this procedure can be followed and will result in preserving the pine for many decades.

The estimated future control requirements on the White River area are as follows:

An intensive ribes check and pine disease survey in 1946 to determine reworking needs. On the basis of present knowledge of conditions, it is not anticipated that much work would be required in 1947. As in the case of the Longmire-Silver Forest area, stream type will need reworking about every five years. This should be supplemented with a canker elimination program. These jobs can be handled with a 25-man field crew for three months. After about 10 years the five-year interval can probably be extended.

SUMMARY OF RECOMMENDATIONS AND ESTIMATES

1. Longmire-Silver Forest Area

1945	Ribes eradication	25 man crew for 3 months
1947	Ribes check and disease survey	1 man for 3 months
1948	Ribes eradication and canker elimination	25 man crew for 3 months
1953	" " " "	20 man " " " "
1958	" " " "	20 man " " "

2. White River Area

1946	Ribes check and disease survey	2 men for 3 months
1947	Ribes eradication and canker elimination	25 man crew for 3 months
1952	" " " "	25 " " " " "
1957	" " " "	25 " " " " "

RESULTS

The following tables show statements of expenditures, results of the 1944 field work and accumulative results for all work done to date.

TABLE 1

EXPENDITURES BY APPROPRIATIONS, CALENDAR YEAR 1944
MOUNT RAINIER NATIONAL PARK

Cooperating Agency	Appropriation	Amount
Bureau of Entomology and Plant Quarantine	Regular BLR-1-4	$ 452.35
National Park Service	Regular BLR-5	11,543.83
Total		$11,996.18

TABLE 2

CLASSIFIED EXPENDITURES, CALENDAR YEAR 1944
MOUNT RAINIER NATIONAL PARK

Item	Bureau of Entomology and Plant Quarantine Regular BLR-1-4	National Park Service Regular BLR-5	Total
Sal. perm. men	$344.02		$ 344.02
Personal services		$11,318.20	11,318.20
Travel and transp.	108.33		108.33
Contractual services		211.79	211.79
Supplies and material		13.84	13.84
Total	$452.35	$11,543.83	$11,996.18

TABLE 3

SUMMARY OF RIBES ERADICATION, 1944
MOUNT RAINIER NATIONAL PARK

Area	Working	Eradication Type	Acres	Effective Man-Days	Ribes by Species						Total Ribes	Per Acre Basis	
					Ribes lacustre	Ribes bracteosum	Ribes watsonianum	Ribes laxiflorum	Ribes acerifolium	Ribes sanguineum		Man-Days	Ribes
Longmire	Third	Pole	269	295	4,834	850		172	114	9	5,979	1.10	22
		Stream	20	19	76	523		13	50		662	.95	33
		Total	289	314	4,910	1,373		185	164	9	6,641	1.09	23
White River	Third	Pole	347	247	266		2,307		301		2,874	.71	8
All Areas	Third	Pole	616	542	5,100	850	2,307	172	415	9	8,853	.88	14
		Stream	20	19	76	523		13	50		662	.95	33
		Total	636	561	5,176	1,373	2,307	185	465	9	9,515	.88	15

TABLE 4

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1930-1944
MOUNT RAINIER NATIONAL PARK

Working	Class	Gross Acres	Net Acres	Effective Man-Days	Total Ribes	Per Acre Basis	
						Man-Days	Ribes
First	NP-Reg.	2,547	1,838	3,806	780,171	1.44	295
	NP-CCC	5,607	1,743	6,264	860,336	1.12	153
	Total	8,254	3,581	10,070	1,640,507	1.22	199
Second	NP-Reg.	766	766	569	19,395	.74	25
	NP-CCC	3,561	2,774	5,372	381,518	1.51	107
	Total	4,327	3,540	5,941	400,913	1.37	93
Third and Other	NP-Reg.	3,914	3,914	3,784	103,464	.97	26
	NP-CCC	1,792	1,572	1,056	51,313	.59	29
	Total	5,706	5,486	4,840	154,777	.85	27
All Workings	NP-Reg.	7,327	6,518	8,159	903,030	1.11	123
	NP-CCC	10,960	6,089	12,692	1,293,167	1.16	118
	Total	18,287	12,607	20,851	2,196,197	1.14	120

TABLE 5

SUMMARY OF RIBES ERADICATION, 1930-1944
MOUNT RAINIER NATIONAL PARK
(Net Control Area)

Working	Area	Eradication Type	Acres	Man-Days	Ribes Destroyed								Total Ribes	Per Acre Basis	
					Ribes lacustre	Ribes viscosissimum	Ribes bracteosum	Ribes watsonianum	Ribes laxiflorum	Ribes acerifolium	Ribes sanguineum	Ribes triste		Man-Days	Ribes
First	Longmire	Reproduction	274	397	40,281		1,101		5,409	5,804			52,595	1.45	192
		Stream	626	1,202	186,687		97,774		53,893	2,858	16		340,214	1.92	543
		Total	900	1,599	225,968		98,875		59,302	8,662	16		392,809	1.78	436
	White River	Reproduction	66	50	6,869	239	21	1,133	550	194			9,006	.76	136
		Pole	1,870	2,087	173,780	69,529	539	139,238	1,189	10,801	91	744	395,911	1.12	212
		Mature	322	264	27,327	12,847			5	45			40,224	.82	125
		Stream	423	744	162,856	1,510	4,869	242	8,820	188	98	8	178,591	1.76	422
		Total	2,681	3,145	370,832	84,125	5,429	140,613	10,564	11,228	189	752	623,732	1.17	233
	All Areas	Reproduction	340	447	47,150	239	1,122	1,133	5,959	5,998			61,601	1.31	181
		Pole	1,870	2,087	173,780	69,529	539	139,238	1,189	10,801	91	744	395,911	1.12	212
		Mature	322	264	27,327	12,847			5	45			40,224	.82	125
		Stream	1,049	1,946	348,543	1,510	102,643	242	62,719	3,026	114	8	518,805	1.86	495
		Total	3,581	4,744	596,800	84,125	104,304	140,613	69,872	19,870	205	752	1,016,541	1.82	284
Second	Longmire	Reproduction	274	271	10,961		1,136			1,462			13,559	.99	49
		Stream	614	526	19,977		23,196		2,394	1,426	50		47,043	.86	77
		Total	888	797	30,938		24,332		2,394	2,888	50		60,602	.90	68
	White River	Reproduction	66	12	221			77					298	.18	5
		Pole	1,870	1,768	36,284	14,304	2,176	6,864	16,224	4,537			80,389	.95	43
		Mature	322	47	1,278	2,011							3,289	.15	10
		Stream	394	657	32,748		164		5				32,907	1.67	84
		Total	2,652	2,484	70,531	16,315	2,330	6,941	16,229	4,537			116,883	.94	44
	All Areas	Reproduction	340	283	11,182		1,136	77		1,462			13,857	.83	41
		Pole	1,870	1,768	36,284	14,304	2,176	6,864	16,224	4,537			80,389	.95	43
		Mature	322	47	1,278	2,011							3,289	.15	10
		Stream	1,008	1,183	52,725		23,350		2,399	1,426	50		79,956	1.17	79
		Total	3,540	3,281	101,469	16,315	26,662	6,941	18,623	7,425	50		177,485	.93	50
Third and Other	Longmire	Pole	563	1,364	17,804		1,753		259	15,582	9		35,407	2.42	63
		Stream	794	1,190	41,312		12,833		1,429	551	6		56,131	1.50	71
		Total	1,357	2,554	59,116		14,586		1,688	16,133	15		91,538	1.88	67
	White River	Pole	3,274	1,456	1,650	3,196		12,822	20	5,184			22,872	.44	7
		Stream	855	407	15,440	2,268	227		703	4			18,642	.48	22
		Total	4,129	1,863	17,090	5,464	227	12,822	723	5,188			41,514	.45	10
	All Areas	Pole	3,837	2,820	19,454	3,196	1,753	12,822	279	20,766	9		58,279	.73	15
		Stream	1,649	1,597	56,752	2,268	13,060		2,132	555	6		74,773	.97	45
		Total	5,486	4,417	76,206	5,464	14,813	12,822	2,411	21,321	15		133,052	.81	24
All Workings	Longmire	Reproduction	548	668	51,242		2,237		5,409	7,266			66,154	1.22	121
		Pole	563	1,364	17,804		1,753		259	15,582	9		35,407	2.42	63
		Stream	2,034	2,918	246,976		133,803		57,722	4,815	72		443,388	1.43	218
		Total	3,145	4,950	316,022		137,793		63,390	27,663	81		544,949	1.57	173
	White River	Reproduction	132	62	7,090	239	21	1,210	550	194			9,304	.47	70
		Pole	7,014	5,311	211,714	87,029	2,715	158,924	17,433	20,522	91	744	499,172	.76	71
		Mature	644	311	28,605	14,858			5	45			43,513	.48	68
		Stream	1,672	1,808	211,044	3,778	5,250	242	9,528	192	98	8	230,140	1.08	138
		Total	9,462	7,492	458,453	105,904	7,986	160,376	27,516	20,953	189	752	782,129	.79	83
	All Areas	Reproduction	680	730	58,332	239	2,258	1,210	5,959	7,460			75,458	1.07	111
		Pole	7,577	6,675	229,518	87,029	4,468	158,924	17,692	36,104	100	744	534,579	.88	71
		Mature	644	311	28,605	14,858			5	45			43,513	.48	68
		Stream	3,706	4,726	458,020	3,778	139,053	242	67,250	5,007	170	8	673,528	1.28	182
		Total	12,607	12,442	774,475	105,904	145,779	160,376	90,906	48,616	270	752	1,327,078	.99	105

BLISTER RUST CONTROL, GLACIER NATIONAL PARK, 1944

By
M. C. Riley, Operation Supervisor

The blister rust control program on Glacier National Park during the 1944 field season was a continuation of that initiated in 1939. Work was started on June 2 and was completed on June 30, being confined to the Two Medicine area which was the only area needing attention at this time. Third working was performed on all stream type and second working was done on the slope north of the campground, on some of the area south of the lake and in patches south and east of the campground. This is located in unsurveyed sec. 36, T. 32 N., R. 14 W. and sec. 1, T. 31 N., R. 14 W., Montana Meridian. A total of 206 acres was covered.

Work was conducted with one field crew of approximately fifteen men from the Civilian Public Service camp. The performance of these assignees was more satisfactory than last year. It was not possible to perform a systematic check on the worked area but close inspection during the progress of the work indicated that satisfactory results were being obtained. No experienced blister rust foreman was available and it was necessary to train a new man for the position.

A representative of the Bureau of Entomology and Plant Quarantine helped plan and organize the work. Supervision was also supplied by a representative of the Bureau who remained on the work for practically the duration of the project. The Bureau also supplied the necessary maps, forms and office supplies for the proper recording and reporting of data. Funds from a regular National Park Service appropriation were used to employ a foreman and to cover incidental expenditures for supplies and equipment.

BLISTER RUST INFECTION

Blister rust infection on Pinus flexilis was found by C. M. Chapman in five scattered locations on the Two Medicine area. Five trees were infected with one canker on each tree. Only one of the cankers had fruited more than once, although all cankers were on 1934 or 1935 wood. This pine infection, probably of 1937 origin, is believed to be the first found east of the Continental Divide in the Northwest.

A reexamination of the infection at the head of Lake McDonald revealed a few more infected trees although those found did not extend the infected area. As was formerly found, there was only one canker per tree with one exception. No cankers were found which had originated since ribes eradication work had been started. A very small amount of infection was found on ribes which had resprouted since the last working.

After the close of the regular field season Park Service officials located infection on P. monticola in sec. 30, T. 32 N., R. 19W. This is outside of any blister rust control area.

CONTROL STATUS

On the four areas thus far selected for protection, the first working is completed and rework is being accomplished according to approved schedules. On all areas, each successive working involves fewer acres and less man-days. At Park Headquarters the proposed work for 1945 should be all that is necessary on this unit for at least five years. This is also true of the Lake Mc Donald area except for the stream type. At East Glacier at least two more workings will be necessary where first working was done in 1943, although one more working should suffice for the remainder of the area, except stream type. At Two Medicine it will probably be necessary to rework portions of the 1944 area once more and here also the stream type will require further attention.

RECOMMENDATIONS

For the orderly progress of the program the only urgent work for the 1945 season would be rework jobs at Lake McDonald and at Park Headquarters. It is estimated that this would require the services of twenty men in the field for two months. If sufficient supervision were available, rework could be done at East Glacier but since there is no known pine infection present, this work can be deferred until 1946.

Some consideration has been given by the Park Service to the inclusion of other areas in the control program. A decision should be made in the near future as to any additional areas in order that plans may be prepared and work initiated for their protection.

RESULTS

The following tables show statements of expenditures, results of the field work for 1944 and accumulative results for all work done to date. In the accumulative table it will be noted that eradication types "brush" and "subalpine" have been combined as "miscellaneous".

TABLE 1

EXPENDITURES BY APPROPRIATIONS, CALENDAR YEAR 1944
GLACIER NATIONAL PARK

Cooperating Agency	Appropriation	Amount
Bureau of Entomology and Plant Quarantine	Regular BLR-1-4	$607.75
National Park Service	Regular BLR-5	359.48
Total		$967.23

TABLE 2

CLASSIFIED EXPENDITURES, CALENDAR YEAR 1944
GLACIER NATIONAL PARK

Item	Bureau of Entomology and Plant Quarantine Regular BLR-1-4	National Park Service BLR-5	Total
Sal. perm. men	$516.03	$240.95	$756.98
Travel and transp.	91.72		91.72
Supplies and material		54.21	54.21
Subsistence		64.32	64.32
Total	$607.75	$359.48	$967.23

TABLE 3

SUMMARY OF RIBES ERADICATION, 1944
GLACIER NATIONAL PARK

Area	Working	Eradication Type	Acres	Effective Man-Days	Ribes by Species				Total Ribes	Per Acre Basis	
					Ribes lacustre	Ribes viscosissimum	Ribes setosum	Ribes inerme		Man-Days	Ribes
Two Medicine	Second	Pole	162	88	4,398	1,082	4,562	216	10,258	.54	63
	Third	Stream	44	116	11,230	32		12,456	23,718	2.64	539
	All Workings	All Types	206	204	15,628	1,114	4,562	12,672	33,976	.99	165

TABLE 4

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1939-1944
GLACIER NATIONAL PARK

Working	Class	Acres	Effective Man-Days	Total Ribes	Per Acre Basis	
					Man-Days	Ribes
First	NP-Reg.	262	301	37,155	1.15	142
	NP-CCC	2,633	2,833	323,841	1.08	123
	NP-CPS	302	771	103,559	2.55	343
	Total	3,197	3,905	464,555	1.22	145
Second	NP-Reg.	731	763	122,606	1.04	168
	NP-CPS	248	288	45,344	1.16	183
	Total	979	1,051	167,950	1.07	172
Third	NP-CPS	44	116	23,718	2.64	539
All Workings	NP-Reg.	993	1,064	159,761	1.07	161
	NP-CCC	2,633	2,833	323,841	1.08	123
	NP-CPS	594	1,175	172,621	1.98	291
	Total	4,220	5,072	656,223	1.20	156

TABLE 5

SUMMARY OF RIBES ERADICATION, 1939-1944
GLACIER NATIONAL PARK

Area	Working	Eradication Type	Acres	Effective Man-Days	Ribes by Species: Ribes lacustre	Ribes viscosissimum	Ribes setosum	Ribes inerme	Total Ribes	Per Acre Basis: Man-Days	Per Acre Basis: Ribes
Park Headquarters	First	Reproduction	358	204	9,869	6,472	15,666		32,007	.57	89
		Pole	284	122	13,428	15,364	8,967		37,759	.43	133
		Miscellaneous	39	119	9,411	21,340	8,353		39,104	3.05	1,003
		All Types	681	445	32,708	43,176	32,986		108,870	.65	160
	Second	Reproduction	134	39	2,876	581	558		4,015	.29	30
		Pole	127	79	376	964	535		1,875	.62	15
		Miscellaneous	39	52	13	973	67	2	1,055	1.33	27
		All Types	300	170	3,265	2,518	1,160	2	6,945	.57	23
	All Workings	Reproduction	492	243	12,745	7,053	16,224		36,022	.49	73
		Pole	411	201	13,804	16,328	9,502		39,634	.49	96
		Miscellaneous	78	171	9,424	22,313	8,420	2	40,159	2.19	515
		All Types	981	615	35,973	45,694	34,146	2	115,815	.63	118
Two Medicine	First	Pole	593	645	40,145	2,705	1,723	8,646	53,219	1.09	90
		Miscellaneous	60	118	3,935	1,050	4,665	1,834	11,484	1.97	191
		Stream	54	480	30,429	438		12,592	43,459	8.89	805
		All Types	707	1,243	74,509	4,193	6,388	23,072	108,162	1.76	153
	Second	Pole	252	181	15,716	1,332	4,562	5,874	27,484	.72	109
		Miscellaneous	16	20	1,495	67		2,471	4,033	1.25	252
		Stream	32	156	46,233	14		25,259	71,506	4.88	2,235
		All Types	300	357	63,444	1,413	4,562	33,604	103,023	1.19	343
	Third	Stream	44	116	11,230	32		12,456	23,718	2.64	539
	All Workings	Pole	845	826	55,861	4,037	6,285	14,520	80,703	.98	96
		Miscellaneous	76	138	5,430	1,117	4,665	4,305	15,517	1.82	204
		Stream	130	752	87,892	484		50,307	138,683	5.78	1,067
		All Types	1,051	1,716	149,183	5,638	10,950	69,132	234,903	1.63	224
Lake McDonald	First	Mature	1,410	913	21,077	4,253	34,175		59,505	.65	42
		Stream	11	39	5,184	35	1,602		6,821	3.55	620
		All Types	1,421	952	26,261	4,288	35,777		66,326	.67	47
	Second	Mature	282	303	3,173	1,305	15,996		20,474	1.07	73
		Stream	11	21	998	130	1,294		2,422	1.91	220
		All Types	293	324	4,171	1,435	17,290		22,896	1.11	78
	All Workings	Mature	1,692	1,216	24,250	5,558	50,171		79,979	.72	47
		Stream	22	60	6,182	165	2,896		9,243	2.73	420
		All Types	1,714	1,276	30,432	5,723	53,067		89,222	.74	52
East Glacier	First	Pole	367	1,005	44,305	14,739	11,042	65,936	136,022	2.74	371
		Stream	21	260	71	158		44,946	45,175	12.38	2,151
		All Types	388	1,265	44,376	14,897	11,042	110,882	181,197	3.26	467
	Second	Pole	86	200	21,816	2,492	9,507	1,271	35,086	2.33	408
	All Workings	Pole	453	1,205	66,121	17,231	20,549	67,207	171,108	2.66	378
		Stream	21	260	71	158		44,946	45,175	12.38	2,151
		All Types	474	1,465	66,192	17,389	20,549	112,153	216,283	3.09	456
All Areas	First	Reproduction	358	204	9,869	6,472	15,666		32,007	.57	89
		Pole	1,244	1,772	97,878	32,808	21,732	74,582	227,000	1.42	182
		Mature	1,410	913	21,077	4,253	34,175		59,505	.65	42
		Miscellaneous	99	237	13,346	22,390	13,018	1,834	50,588	2.39	511
		Stream	86	779	35,684	631	1,602	57,538	95,455	9.06	1,110
		All Types	3,197	3,905	177,854	66,554	86,193	133,954	464,555	1.22	145
	Second	Reproduction	134	39	2,876	581	558		4,015	.29	30
		Pole	465	460	37,908	4,788	14,604	7,145	64,445	.99	139
		Mature	282	303	3,173	1,305	15,996		20,474	1.07	73
		Miscellaneous	55	72	1,508	1,040	67	2,473	5,088	1.31	93
		Stream	43	177	47,231	144	1,294	25,259	73,928	4.12	1,719
		All Types	979	1,051	92,696	7,858	32,519	34,877	167,950	1.07	172
	Third	Stream	44	116	11,230	32		12,456	23,718	2.64	539
	All Workings	Reproduction	492	243	12,745	7,053	16,224		36,022	.49	73
		Pole	1,709	2,232	135,786	37,596	36,336	81,727	291,445	1.31	171
		Mature	1,692	1,216	24,250	5,558	50,171		79,979	.72	47
		Miscellaneous	154	309	14,854	23,430	13,085	4,307	55,676	2.01	362
		Stream	173	1,072	94,145	807	2,896	95,253	193,101	6.20	1,116
		All Types	4,220	5,072	281,780	74,444	118,712	181,287	656,223	1.20	156

PROGRESS OF RIBES ECOLOGY WORK AND DEVELOPMENTAL WORK IN METHODS OF RIBES ERADICATION IN THE NORTHWESTERN REGION FOR 1944

By
V. D. Moss, Forest Ecologist
and
H. R. Offord, Pathologist

FOREWORD

Activities of the developmental and improvement project BLR-1-6 for the calendar year of 1944 have included office, laboratory, greenhouse and field work. The present annual report, as in past years, is primarily a report on field work. Only a brief statement (Section III of this report) is given of activities other than field work. Section II presents details of the plot data secured during 1944 and Section I is a status report on the various field jobs in ecology and methods improvement currently in progress. Attention should be called to new work started this year in the establishment of milacre plots in Latin Square design for the purpose of correlating ribes regeneration and age of cutting of timber. Data from these plots should assist in the broader phases of planning control work in relation to timber management practices. Disease study work in relation to effectiveness of control continued as an activity of this project during 1944. Principal jobs completed on disease study included a sample check of the white pine on the Powder House plot, Clearwater Forest and establishment of a new field plot at Hanna Road, Kaniksu National Forest, to study the effectiveness of control associated with a small residual population of Ribes lacustre on a 3 to 4 year interval between workings. To permit full attention to the compilation of data which have been accumulated over a period of years, no annual report will be submitted this year on disease study work.

I. SUMMARY

A. Grazing of Sheep on Cutover Lands in Relation to the Regeneration and Growth of Ribes and Western White Pine

1. Status of work. Four studies are in progress on problems relating to grazing of sheep and control of the rust on cutover lands in the white pine type, namely: (a) Effects of normal grazing of recent cutover lands on the germination, growth and development of ribes and western white pine seedlings, (b) Effects of deferred grazing on . . . . , seedlings, (c) Effects of controlled grazing on . . . . seedlings, and (d) Effects of continuous seasonal grazing of old logged and burned-over lands on the regeneration of ribes and western white pine seedlings. Discussions are given for (a) and (b) problems in the section on field work. Ribes have been removed from all study areas except (c), a project carried on in cooperation with the School of Forestry, University of Idaho, and the Potlatch Timber Protective Association.

   (a) Five exclosures with accompanying controls were established during the years 1939 and 1940 to study the effects of grazing

recent cutover lands on the germination and subsequent growth of ribes and western white pine seedlings. Three of these plots are located on the Clearwater and two on the St. Joe Forests. With 5 years of study now completed the following conclusions have been reached:

(1) Average production of live stem is greater for ribes subjected to grazing. Cropping of terminal shoots results in the formation of more main stems and an increased number of leaf-bearing lateral branches arising from adventitious buds. Concomitant with increased production of live stem is a larger number of leaves for ribes subjected to grazing.

(2) Average height of ribes bush is greater when subjected to grazing. Significant is the fact that fewer ribes under 6 inches in height are to be found on the grazed areas from the second or third growing seasons on. It follows then that a higher percentage of the bushes attain a greater height on grazed areas making possible increased efficiency in ribes eradication.

(3) Grazing was not found responsible for increasing the problem in ribes regeneration on the open range over that which occurs normally. More ribes seedlings were found germinating and surviving on ungrazed area than on the recent cutover land subjected to grazing.

(4) Germination of white pine seed is considerably greater on areas subjected to grazing. Loss of seedlings from trampling and browsing is uncommon on the open range.

(b) The deferment of grazing from cutover lands which have been under range use by sheep for some 5 or 6 years does not create a more favorable condition for increased efficiency in ribes eradication by comparison with lands under continued use. Two exclosures and accompanying controls were established in 1940 on the Clearwater Forest from which these conclusions are drawn:

(1) Ribes seeds have continued to germinate over a longer period following cutting of mature timber on the areas deferred from range use.

(2) Growth or production of live stem has varied but little between bushes on area deferred and under continued grazing. Height of ribes bush has been slightly greater on area deferred from grazing. Number of main stems, lateral branches, total live stem and number of leaves have been greater for bushes under continued grazing.

(3) Although the average height per bush is greater on areas deferred from grazing such areas from the fourth year on of deferment, have a higher percentage of total bushes less than 6 inches in height. Density of associated vegetation was found considerably higher on area deferred from grazing which makes more difficult the job of searching for small ribes.

(c) The effects of controlling the intensity of grazing on cutover lands have shown overgrazing on slopes greater than about 40 percent often is responsible for germination of ribes seed and rather severe loss of pine seedlings. Moderate grazing at the rate of 21 acres per animal unit has no material effect upon the problem of ribes regeneration or loss of pine seedlings. Seedlings of grand fir Abies grandis and common Douglas fir Pseudotsuga taxifolia succumb in large numbers from trampling by sheep.

(d) The effects of grazing sheep year after year on old logged and burned-over areas that have become sodded to varying degrees have no importance relative to the problem of ribes regeneration. The sod is broken sufficiently however to be encouraging for the germination of white pine seed. Stocking of white pine on these areas is noticeably increasing as a result of continued grazing.

B. Ecological Studies of Ribes and Western White Pine

1. Status of work. Investigations were continued the past season on the following studies: (a) The effects of variable light and moisture conditions on the germination, growth and development of Ribes lacustre, R. viscosissimum and Pinus monticola, (b) Stand improvement practices in relation to the ecological development of ribes, (c) Slash disposal measures in relation to the regeneration and development of ribes and white pine seedlings, (d) Direct seeding of western white pine, (e) Ribes regeneration key for the western white pine region, and (f) Observations on the resprouting habits of R. lacustre. In addition a study was started to determine "Longevity of ribes seeds as affected by change of environmental conditions resulting from cutting of mature timber."

(a) The study of variable light and moisture conditions in relation to the germination, growth and development of ribes and western white pine seedlings was established under conditions of full sun, half shade and full shade light intensities. At each of these light stations seeds of ribes and white pine were sown on natural duff, mineral and burned-mineral soil surfaces. In addition to the conclusions given in the 1943 annual report the following facts can be added:

(1) Disturbance of the three types of soil surfaces resulted in increased germination of ribes seeds over the undisturbed controls.

(2) Germination of ribes seeds on both the disturbed and undisturbed soil surfaces increased toward full shade conditions of low soil temperature and minimum variation of soil moisture. Thus the length of time ribes seeds will remain viable for germination is dependent upon soil moisture and soil temperature conditions.

(3) Seed of R. lacustre germinates more readily under all conditions of environment than does seed of R. viscosissimum. R. lacustre seed will thus represent the greater regenerational hazard of the two species following minor disturbances by ribes eradication, erosion, wild life and blowdowns.

(b) Ribes ecological studies which relate to stand improvement practices for the western white pine type are being continued in cooperation with Timber Management and the Northern Rocky Mountain Forest and Range Experiment Station. In addition to the maintenance of these studies considerable time is being devoted to field conferences for the close coordination of timber management practices with the rust control program. Seven timber management conferences were attended this past season and two relating to fuel reduction. Fuel reduction work will become an important factor in aiding control of the rust. The advantages of fuel reduction as relating to control of the rust and management of white pine are as follows:

(1) Areas of hazardous fuels in the white pine type will be reduced by control burning. Burning will be followed by planting of white pine on favorable sites.

(2) Burning will establish conditions favorable for the total suppression of ribes at low acreage costs on areas now excluded from the control units because of fire risks, and difficult eradication conditions will make possible the inclusion of such areas upon planting of white pine.

(3) On good white pine sites now included in the control units but deferred from work because of low stocking, burning and planting will reduce period of maturity by some 40 years with maximum volume returns.

(4) Fuel reduction will remove many sources of heavy ribes concentrations now responsible for long distance spread of the rust. Many areas of pine now lost from the rust can likewise be burned and rehabilitated by planting.

(c) Studies of slash disposal measures in the western white pine type are being carried on in cooperation with the Forest Service, Potlatch Forests, Inc., and the Slash Disposal Committee of the Inland Empire Section of the Society of American Foresters. Continued observations are being made on the experimental areas of partial and complete disposal of slash on the Clearwater and St. Joe Forests. Partial disposal measures are materially reducing the ribes regeneration problem on newly cutover areas. Probably of greatest importance is the limited distribution of ribes over the areas as a result of partial disposal. The bushes are found almost entirely along skid trails and firebreaks leaving considerable area free of ribes where previously extensive burning of slash piles under the method of complete disposal resulted in larger numbers of seedlings distributed more widely over the area. This limited distribution and numbers of ribes resulting from partial disposal of slash not only makes the job of ribes eradication less difficult but does much to set ribes apart from the bulk of new pine seedlings coming in on undisturbed ground.

(d) Studies in direct seeding of western white pine were continued and extended in scope during the past season on the Kaniksu and St. Joe Forests. Encouraging results are being obtained in germination by first cracking the seed coat, stratifying for about 2 months in cold storage and broadcast sowing in the spring when soil temperatures become favorable for immediate germination. Seed germinates and starts growth in a relatively short time thus seed-eating rodents have but a few days to consume much of the ungerminated seed. Work is now underway toward the development of a mechanical seed-coat cracker. As white pine produced appreciably no cone crop in 1944 further field work will not be undertaken until new seed can be obtained.

(e) Additional work was done this past season on the revision of the ribes regeneration key. It was found necessary to reweight some of the factors found applicable in the determination of potential ribes regenerational problems. The key has served a valuable purpose if for no other reason than making known a systematic method for the determination of potential areas of ribes likely to originate from stored seed. The key was used to particular advantage in the determination of potential ribes populations on the Fishhook Timber Sale Area in the St. Joe National Forest. The key plus collection of soil samples for the extraction of ribes seeds provided a good cross check. Keying to determine potential ribes populations resulted in findings substantitated by the extraction of seed from soil samples. Many of these determinations will be made for Timber Management before cutting practices have been adopted in order that the ecology of ribes can be given

due consideration in a plan of sustained management.

(f) Further observations were made of the R. lacustre bushes decapitated in 1942 to study habits of resprouting. Given in the 1943 annual report are final results of this study with the exception of knowledge on roots retaining healthy tissue without resprouting by the end of the 1943 growing season. No severed roots in the above status were found resprouting in 1944. Since resprouting is dependent upon adequate reserves of stored food for the formation and growth of adventitious buds arising solely from crown tissue there is little reason to suspect much delay in the occurrence of new aerial shoots. Large roots of old bushes, however, might effectively resprout after a delay of one or more growing seasons because of the greater capacity for stored foods. To establish this point, and because the 1942 treatments were of R. lacustre bushes 4 to 6 years of age, the study will be duplicated on older bushes having larger roots.

(g) One of the principal problems in the region relates to the number of years ribes seeds will remain viable for germination in the organic soil mantle undisturbed by the logging operations. Studies have shown that when ribes seeds are stored beneath the organic mantle under a minimum of environmental variation, they remain viable for a period equal to or greater than the life of a timber stand. When this environment is altered by cutting practices ribes seeds become exposed to conditions favorable for germination. The number of seeds germinating is dependent upon the degree of disturbance or soil aeration, and the establishment of optimum soil temperature and soil moisture conditions. As logging does not result in a complete disturbance of the forest floor, a considerable quantity of ribes seeds remain undisturbed and ungerminated beneath the organic soil mantle. The altered conditions of environment brought about by cutting of mature stands are not conducive to a lengthy storage period of ribes seeds because of soil aeration and the variations of soil temperature and soil moisture. The number of years ribes seeds will continue to remain viable after cutting has altered the environment of storage is not known. Field observations have indicated that the percentage of viable ribes seeds gradually decreases each year following logging, and after some 15 to 20 years have elapsed, only a small amount of this old seed is capable of germination upon disturbance of the forest floor. Plots were established this past season on the Kaniksu, Coeur d'Alene and St. Joe Forests to study this question in detail.

. Tests of Ammonium Sulfamate for Ribes Eradication.

1. Status of Work. In Idaho, field work in the testing of ammonium

sulfamate for ribes eradication was started in September 1943 when aqueous sprays were applied to stream-type R. lacustre along Crystal Creek, St. Joe National Forest. In early season, mid-season, and late season of 1944 sulfamate sprays were applied to R. lacustre in the Crystal Creek area. Also, in June and again in September 1944 sulfamate sprays were tested on R. viscosissimum and upland-type R. lacustre near the head of LaClerc Creek, Kaniksu National Forest.

Results to date indicate that aqueous ammonium sulfamate applied as a spray and soil drench to stream-type R. lacustre at the rate of 1 pound and 2 gallons should provide close to 100 percent kill of bushes. In terms of dosage, this is about the same as the recommended dosage for the practical eradication of R. petiolare. At present, however, the cost of ammonium sulfamate is about twice that of Atlacide so that the total cost (labor and chemical) of eradicating stream-type R. lacustre by sulfamate would be about 30 percent more than previous chemical spray work on R. petiolare. There is some possibility that the practical lethal dosage of ammonium sulfamate on stream-type R. lacustre may be less than one pound per milacre. No conclusions are yet available from the tests on R. viscosissimum and upland R. lacustre.

II. FIELD WORK

A. Grazing of Sheep on Cutover Lands in Relation to the Regeneration and Growth of Ribes and Western White Pine.

Effects of Grazing Recent Cutover Lands on the Germination, Growth and Development of Ribes and Western White Pine Seedlings.

Previous discussions of this study are given in the 1939 to 1943 annual reports. Final summaries upon completion of 5 years study of growth characteristics between grazed and ungrazed ribes are presented in the 1943 annual report. Grazing was found to have caused a significant increase in the total footage of live stem and the number of leaves per ribes bush. Responsible for this were the formation of more main stems and an increased number of lateral branches arising from adventitious buds upon cropping of terminal shoots. Cropping of ribes results in a similar injury to that of pruning fruit trees with subsequent increased production of new wood. To correlate grazing in relation to the efficiency of ribes eradication bushes on the ungrazed and grazed areas of plots 1 and 2 have been grouped into three height classes. The first class of 6 inches or less in height represents a size of ribes bush most difficult to find. Less than 75 percent of bushes in this height class are normally recovered. The second class of 6.1 to 12 inches in height is an intermediate size of bush of which 75 percent or more should be found. The third class of 12.1 inches or over in height represents a size of which better than 90 percent should be found by the eradication crews. The total number of ribes and the percent of bushes in each size class by years are shown in table 1.

TABLE 1

TOTAL NUMBER OF RIBES BY YEAR AND PERCENT OF TOTAL BUSHES IN EACH OF THE THREE HEIGHT CLASSES FOR PLOTS 1 AND 2 IN THE CLEARWATER FOREST

Year	Status of Area in Respect to Grazing: Ungrazed — Total No. Ribes	Ungrazed — Percent of total bushes in height class: Under 6"	6.1-12"	Over 12.1"	Grazed — Total No. Ribes	Grazed — Percent of total bushes in height class: Under 6"	6.1-12"	Over 12.1"
PLOT 1 - NORTH EXPOSURE								
1939	76	94.7	5.3	0	92	84.8	12.0	3.2
1940	79	79.7	16.5	3.8	93	55.9	30.1	14.0
1941	77	51.9	24.7	23.4	89	31.5	29.2	39.3
1942	73	43.8	12.4	43.8	88	19.3	23.9	56.8
1943	72	34.7	16.7	48.6	85	9.4	24.7	65.9
PLOT 2 - SOUTH EXPOSURE								
1939	39	82.0	15.4	2.6	17	82.4	11.8	5.8
1940	40	57.5	35.0	7.5	17	35.3	41.2	23.5
1941	34	41.2	35.3	23.5	15	26.7	46.7	26.6
1942	37	32.4	40.5	27.1	15	20.0	40.0	40.0
1943	35	28.6	25.7	45.7	15	6.7	26.7	66.6

Of significant importance is the shift of height classes of ribes between ungrazed and grazed area. Considering the year 1940 as the earliest possible date of initial ribes eradication (this being the third growing season after the 1937 cut) 79.7 percent of the ribes on the ungrazed area of plot 1 were under 6 inches in height as compared to 55.9 percent on the grazed area. Eradication crews have been found to remove on the average better than 75 percent of all bushes over 6 inches in height and better than 90 percent of all bushes over 12 inches in height. With these efficiencies in mind important differences in height classes of ribes between grazed and ungrazed area can be observed in table 1. An important advantage for increased efficiency in ribes eradication is apparent for grazing of sheep on recent cut-over lands with the greater number of ribes falling into the larger height classes. Three physiological differences seem apparent for the height class advantage of ribes on grazed over ungrazed area. One is the lessened competition for ribes resulting from a lower density of associated vegetation. Another results directly from cropping of terminal shoots causing increased development of roots and the potential storage of food for new and more rapid growth. The third concerns the apparent stimulus for growth in soil aeration or cultivation from trampling and the added nutritional value from sheep dung.

The regeneration of ribes seedlings was found to continue over a greater number of years on ungrazed ground following the 1937 cutting of mature than on the areas subjected to grazing (table 2). Upon termination of period in which maximum germination of ribes seeds occur following a logging disturbance rodents were found responsible for nearly all additional ribes seedlings originating on the ungrazed exclosures. Ribes seeds are brought to the surface of the forest floor in the soil deposits raised by burrowing rodents. These mounds of fresh mineral soil present ideal germinating beds for newly exposed seed which has been many years in storage beneath the humus layer. On the areas being seasonably grazed these soil mounds of burrowing rodents are largely dispersed by the trampling of sheep. Seldom found on the open range therefore are ribes seedlings originating from rodent mounds because exposed seed becomes scattered to duff or other organic surfaces unfavorable for germination. Agitation of the duff surface by the trampling hoofs of sheep work exposed seed into the lower organic zone where germination seldom results. The few seedlings which have been observed germinating on rodent burrowings have been root-loosened in time and trampled out. Grazing of sheep on cutover lands following cutting does not add to the regenerational problem of ribes which normally follows a major disturbance from cutting. Ribes seedlings originating from a disturbance caused by grazing as in the case of heavy scarification on driveways or on bedding ground, and trailing on extreme slopes are usually offset in numbers by the mortality from tramping and browsing.

TABLE 2

NUMBER AND YEAR OF ORIGIN OF RIBES AND WESTERN WHITE PINE SEEDLINGS ON RECENT CUTOVER LANDS OF PLOTS 1 AND 2 IN THE CLEARWATER FOREST

Year of Origin	No. Ribes		No. White Pine	
	Ungrazed	Grazed	Ungrazed	Grazed
PLOT 1 - NORTHERN EXPOSURE				
1939	73	92	247	230
1940	11	2	21	21
1941	2	0	4	4
1942	0	0	7	6
1943	1	0	10	18
1944	0	0	17	67
TOTAL	87	94	306	346
PLOT 2 - SOUTHERN EXPOSURE				
1939	43	17	71	67
1940	1	0	3	14
1941	2	0	3	5
1942	0	0	3	9
1943	0	0	2	9
1944	0	0	6	36
TOTAL	46	17	88	140

Table 2 shows the comparative numbers and year of origin of ribes and white pine seedlings on the grazed and ungrazed areas of plots 1 and 2. The bulk of ribes seeds germinated within two growing seasons following cutting and the disposal of slash. Mature timber was cut during the winter months of 1937 and slash disposed of during the fall of 1938. Ribes seedlings germinating in 1939 originated prior to initial grazing in late September of the same year. The 1940 seedlings of both ribes and pine are therefore the first to be considered in relation to possible origin from the grazing disturbance. Only two ribes seedlings have appeared on the grazed portions of plots 1 and 2 since beginning of the study as against 17 seedlings on the ungrazed exclosures. Care should be exercised in attaching significance to the presence of dwarfed ribes bushes and new seedlings on overgrazed areas and in applying such observations to average conditions on the open range under regulatory management. There is of course little excuse for overgrazing but where such does occur on managed allotments the abusive condition seldom if ever represents more than a small fraction of the total acreage in the grazing unit. Consistently used bedding grounds and driveways require special consideration in the eradication of ribes as does stream type with its permanency of ribes habitat.

The total number of white pine seedlings germinating has been greater on the grazed areas of both plots 1 and 2. Data on the mortality of seedlings which

have not changed materially are shown in Table 5 of the 1943 annual report. The only good seed year since the plots were established occurred in 1943. This crop was responsible for a noticeable increase of seedlings germinating in 1944. The increase is noteworthy on the grazed areas of both plots 1 and 2. Moderate scarification of the soil surface by trampling of sheep each season as they move over the areas creates a favorable medium for germination of pine seed. This condition is also favorable for the establishment of seedlings.

Effects of Deferred Grazing on the Germination, Growth and Development of Ribes and Western White Pine Seedlings

The purpose of this study was to determine whether increased growth of small bushes would permit the establishment of adequate control standards upon deferment of grazing on cutover lands. In addition a measure of vegetative cover is being made to determine the influence of deferred versus continued grazing upon searching conditions for the eradication of ribes. The study was established upon lands from which mature timber had been cut in 1934, grazed each year thereafter and eradicated of ribes for the first time in 1939. The plots were established in 1940 on area where sufficient small ribes could be found after the 1939 eradication. Previous discussions of this study have been made in the 1940, 1941 and 1942 annual reports. Reported herein are final summary tables for ribes regeneration, growth and visability studies on areas deferred and under continued seasonal grazing for plots 6 and 7 in the Clearwater Forest.

TABLE 3

NUMBER, YEAR ORIGIN AND MORTALITY BY YEAR ORIGIN OF RIBES UPON COMPLETION OF 5 YEARS' STUDY OF DEFERRED AND CONTINUED GRAZING OF PLOTS 6 AND 7 IN THE CLEARWATER FOREST

Year of Origin of Ribes	Plot 6 - North Exposure						Plot 7 - South Exposure					
	Status of Plot Area in Respect to Grazing											
	Deferred			Continued			Deferred			Continued		
	Alive	Dead	Total	Alive	Dead	Total	Alive	Dead	Total	Alive	Dead	Total
1935-1939	41	5	46	39	4	43	36	6	42	32	10	42
1940	24	6	30	2	1	3	2	0	2	4	2	6
1941	19	3	22	4	1	5	4	0	4	3	0	3
1942	2	0	2	0	0	0	0	0	0	0	0	0
1943	0	0	0	0	0	0	2	2	4	0	0	0
1944	1	0	1	0	0	0	0	0	0	0	0	0
Total	87	14	101	45	6	51	44	8	52	39	12	51

Germination of stored ribes seed has continued over a longer period of years following the 1934 cutting operation on the deferred areas of plots 6 and 7 than on the ground subjected to continued seasonal grazing. Significant differences in number of ribes seedlings originating since establishment of the study in 1940 occur only for plot 6 on a north exposure. Responsible for continued regeneration of ribes seedlings on both deferred and grazed areas have been largely soil-burrowing rodents. Nearly all the 30 new seedlings in 1940 and the 22 seedlings in 1941 originating on the deferred area of plot 6 germinated close together where many bushes had been removed by eradication in 1939 and burrowing rodents were working. Two ribes seedlings on the grazed area of plot 6 originated directly as a result of excessive trailing across one corner of the plot. No evidence was found in the 5 years of study indicating that the grazing of sheep on cutover lands is in any way responsible for an increased problem in ribes regeneration over that which occurs normally following a logging disturbance. Ribes will originate from disturbances caused by grazing but grazing is also a cause of mortality of equal or greater numbers of ribes than are found germinating. Abusive use of the range as excessive trailing on steep slopes and heavy scarification of the forest floor from trailing along driveways and trampling of bedding grounds may cause regeneration of new ribes seedlings. Fortunately such abusive conditions are not common occurrences on open range under an animal quota allotment.

TABLE 4

COMPARISON OF AVERAGE GROWTH DIFFERENCES PER BUSH
OF RIBES ON DEFERRED AND GRAZED AREAS
OF PLOTS 6 AND 7 IN THE CLEARWATER FOREST

Year Data	No. Ribes	Averages Per Bush								
		Main Stems		Laterals		Feet of Live Stem			Bu. Ht.	No.
		No.	F.L.S.	No.	F.L.S.	Old	New	Total	Ft.	Leaves
Plot 6 - Deferred Grazing										
1940	46	1.02	.42	1.23	.29	.36	.35	.71	.34	9.65
1941	44	1.09	.86	3.06	.46	.71	.61	1.32	.86	17.41
1942	43	1.14	1.22	5.14	.98	1.32	.88	2.20	1.22	30.16
1943	41	1.17	1.96	6.23	1.58	2.20	1.34	3.54	1.78	39.53
1944	41	1.23	2.98	8.10	2.34	3.54	1.78	5.32	2.24	52.08
Plot 6 - Continued Grazing										
1940	43	1.07	.45	1.43	.33	.41	.37	.78	.39	12.59
1941	41	1.21	.81	4.22	.66	.78	.69	1.47	.79	25.22
1942	41	1.57	1.13	8.56	1.55	1.47	1.21	2.68	1.03	38.40
1943	40	1.84	1.38	13.07	2.64	2.68	1.34	4.02	1.69	53.78
1944	39	1.92	2.03	17.42	3.71	4.02	1.72	5.74	1.94	71.23
Plot 7 - Deferred Grazing										
1940	41	1.07	.56	2.15	.38	.53	.41	.94	.54	15.34
1941	39	1.12	.86	2.30	.46	.94	.38	1.32	.81	26.38
1942	38	1.18	1.13	4.03	.92	1.32	.73	2.05	1.19	34.83
1943	36	1.21	1.87	5.42	1.34	2.05	1.16	3.21	1.64	42.60
1944	36	1.27	2.37	7.96	1.96	3.21	1.12	4.33	2.02	55.16
Plot 7 - Continued Grazing										
1940	42	1.04	.49	1.93	.36	.48	.37	.85	.47	13.77
1941	37	1.09	.80	3.16	.73	.85	.68	1.53	.78	32.51
1942	34	1.25	.96	5.84	1.22	1.53	.65	2.18	1.14	41.08
1943	33	1.41	1.48	9.33	1.96	2.18	1.26	3.44	1.58	55.62
1944	32	1.67	2.02	16.10	2.84	3.44	1.42	4.86	1.87	67.34

Table 4 shows the comparative growth habits of ribes on deferred as against area under continuous grazing since logging in 1934.

In 1944 growth differences of ribes upon completion of 5 years' study of plot 6 on a north exposure are as follows: Number of main stems or shoots 1.23 with 2.98 feet of live stem as against 1.92 with 2.03 feet of live stem per bush. Number of lateral branches are 8.10 with 2.34 feet of live stem as against 17.42 laterals with 3.71 feet of live stem. Grazing of terminal shoots is responsible for the development of many lateral branches arising from adventitious buds. The footage of old live stem per ribes in the exclosure is 3.54 as against 4.02; new or current year's live stem 1.78 and 1.72 with totals of 5.32 as against 5.74. Average height of bush on area deferred

of grazing is 2.24 as against 1.94 on the ground subjected to grazing. Number of leaves per bush for ribes in the exclosure is 52.08 as against 71.23 for ribes subjected to grazing. Here again is a striking difference in plant structure caused by browsing of terminal shoots resulting in the formation of many more leaf-bearing lateral branches arising from adventitious buds. About the only difference in growth of ribes unexposed to grazing is the slight margin in height of bush over those subjected to grazing. The importance of this margin will be discussed later in relation to grouping of ribes by height classes.

Average growth differences of ribes on area deferred as against continued grazing for plot 7 on a south exposure are as follows: Number of main stems or shoots 1.27 with 2.37 feet of live stem as against 1.67 with 2.02 feet of live stem. Number of lateral branches per bush for ribes on deferred area is 7.96 with 1.96 feet of live stem and 16.10 laterals per bush with 2.84 feet of live stem on the area subjected to grazing. The footage of old live stem per ribes bush in the exclosure is 3.21 as against 3.44; new or current year's live stem 1.12 and 1.42 with totals of 4.33 and 4.86. Average height of bush on deferred area is 2.02 feet as against 1.87 on area subjected to continued grazing. Number of leaves per bush are 55.16 for ribes on deferred area as against 67.34 for ribes on grazed area.

TABLE 5

TOTAL NUMBER AND PERCENT OF TOTAL RIBES ORIGINATING PRIOR TO 1940 IN EACH HEIGHT CLASS FOR PLOTS 6 AND 7 IN THE CLEARWATER FOREST

Year	Status of Plot Area in Respect to Grazing							
	Deferred				Continued			
	Total No. Ribes	Percent of total bushes by height class			Total No. Ribes	Percent of total bushes by height class		
		Under 6"	6.1"-12"	Over 12.1"		Under 6"	6.1"-12"	Over 12.1"
Plot 6 - Northern Exposure								
1940	46	26.1	67.4	6.5	43	25.6	69.8	4.6
1941	44	22.7	61.4	15.9	41	22.0	63.4	14.6
1942	43	16.3	39.5	44.2	41	14.6	48.8	36.6
1943	41	12.2	29.3	58.5	40	7.5	40.0	52.5
1944	41	9.8	17.0	73.2	39	5.1	28.2	66.7
Plot 7 - Southern Exposure								
1940	41	22.0	68.3	9.7	42	26.2	61.9	11.9
1941	39	20.5	61.5	18.0	37	21.6	54.1	24.3
1942	38	15.8	36.8	47.4	34	14.7	44.1	41.2
1943	36	16.7	22.2	61.1	33	9.1	33.3	57.6
1944	36	13.9	16.7	69.4	32	9.4	25.0	65.6

To correlate grazing in relation to the efficiency of ribes eradication, ribes data on the areas deferred and under continuous seasonal grazing have been grouped into three height classes. These ribes are those which originated during the years 1935 to 1939 and remained after the initial working in 1939. With a total of 46 ribes on the deferred area of plot 6 in 1940, 26.1 percent were under 6 inches in height, 67.4 from 6.1 to 12 inches in height and 6.5 over 12.1 inches in height. In 1944 after the completion of the fifth year's growth of ribes on area deferred from grazing 9.8 percent remained under 6 inches in height, 17.0 percent from 6.1 to 12 inches and 73.2 percent were over 12.1 inches in height. On the area under continuous seasonal grazing since logging there were 25.6 percent of the bushes under 6 inches in height in 1940, 69.8 percent from 6.1 to 12 inches and 4.6 percent over 12.1 inches in height. With five additional years of grazing there were present in 1944, 5.1 percent of the 39 bushes still under 6 inches in height, 28.2 percent from 6.1 to 12 inches and 66.7 percent over 12.1 inches in height.

Plot 7 on a southern exposure had in 1940 a total of 41 ribes on the area deferred of grazing and 42 ribes on the area under continuous grazing. On the deferred area 22.0 percent of the 41 ribes were under 6 inches in height, 68.3 percent from 6.1 to 12 inches and 9.7 percent over 12.1 inches in height. On the area under continuous seasonal grazing there were 26.2 percent of the bushes in 1940 under 6 inches in height, 61.9 percent from 6.1 to 12 inches and 11.9 percent over 12.1 inches in height. In 1944 upon completion of 5

years of study there remained on the deferred area 13.9 percent of the ribes bushes under 6 inches in height, 16.7 percent from 6.1 to 12 inches and 69.4 percent of the bushes over 12.1 inches in height. In contrast on the area under continuous grazing there existed 9.4 percent of the ribes under 6 inches, 25.0 percent from 6.1 to 12 inches and 65.6 percent over 12.1 inches in height.

If the percentage compilations are studied in view of known efficiencies in ribes eradication as related to size of bush, there can be found no striking differences of deferred as compared to continuous grazing. On the basis of mathematical averages it is not advisable to draw immediate conclusions. The data will be subjected to a statistical analysis at some later date and the resulting information made known.

B. Ecological Studies of Ribes and Western White Pine

The Effects of Variable Light and Moisture Conditions on the Germination, Growth and Development of R. lacustre, R. Viscosissimum and P. monticola.

This ecological study was established in 1940 for the purpose of measuring important factors influencing germination survival and growth of the two major species of ribes in comparison to white pine under full sun, half shade and full shade light intensities. At each of these light stations seed of ribes and pine were sown on natural duff, mineral and burned-mineral soil surfaces. Ribes were removed from the plots in 1943 at the close of the third growing season. Previous discussions of this study have been made in the 1940 to 1943 annual reports.

TABLE 6

NUMBER OF RIBES AND WHITE PINE SEED GERMINATING DURING THE SEASONS 1941, 1942, 1943 and 1944, TOTAL SEED GERMINATING DURING THIS PERIOD AND PERCENT OF TOTAL SEED SOWN GERMINATING

Surface	Species	Light Intensity	Number Seed Germinating by seasons				Total Seed Germinating	Percent of Total Seed Sown Germinating
			1941	1942	1943	1944		
Duff	Ribes lacustre	Full Sun	15	674	19	0	708	4.4
		Half Shade	42	1,348	239	12	1,641	10.3
		Full Shade	771	5,968	479	297	7,515	47.0
	Ribes viscosissimum	Full Sun	16	2	0	0	18	.1
		Half Shade	54	1	0	0	55	.3
		Full Shade	288	0	68	15	371	2.3
	Western White Pine	Full Sun	20	6	0	0	26	1.3
		Half Shade	49	90	5	0	144	7.2
		Full Shade	841	212	37	0	1,090	54.5
Mineral	Ribes lacustre	Full Sun	3,184	2,134	57	0	5,375	33.6
		Half Shade	2,725	6,078	367	16	9,186	57.4
		Full Shade	1,937	6,191	1,992	365	10,485	65.5
	Ribes viscosissimum	Full Sun	1,322	7	0	0	1,329	8.3
		Half Shade	1,092	11	0	0	1,103	6.9
		Full Shade	1,083	0	3	18	1,104	6.9
	Western White Pine	Full Sun	883	14	0	0	897	44.8
		Half Shade	1,170	29	11	0	1,210	60.5
		Full Shade	1,434	44	21	0	1,499	74.9
Burned-Mineral	Ribes lacustre	Full Sun	1,966	5,967	23	0	7,956	49.7
		Half Shade	2,650	8,493	437	7	11,587	72.4
		Full Shade	2,233	6,326	1,183	52	9,794	61.2
	Ribes viscosissimum	Full Sun	740	13	0	0	753	4.7
		Half Shade	1,556	19	0	0	1,575	9.8
		Full Shade	1,554	0	44	7	1,605	10.0
	Western White Pine	Full Sun	314	1	0	0	315	15.7
		Half Shade	1,200	39	7	0	1,246	62.3
		Full Shade	1,379	49	13	0	1,441	72.0

Table 6 shows the number of ribes and white pine seed germinating during the four seasons 1941 to 1944 on the three soil surfaces under the three intensities of light. The total number of seed germinating during the four seasons as well as the percent of total seed sown which germinated are also given. Ribes seeds were sown at the rate of 800 seeds per square foot, a total of 16,000 for each soil surface. White pine seeds were sown at the rate of 100 per square foot and totaled 2,000 seeds for each plot. The number of seed germinating in 1944 includes seedlings from the three subplots of each surface disturbed when ribes were removed by pulling and the two subplots or controls

from which bushes were removed by cutting at ground level. Pruning shears were used in the latter case to leave ground undisturbed for continued observation on germination period of total seed sown.

The percent of total seed sown which germinated increased toward conditions of full shade with the exception of R. lacustre seed on burned-mineral soil. It is interesting to note the longer period over which R. lacustre seeds have germinated in large numbers as compared to the germination of R. viscosissimum seed. The disturbance of the three subplots on each of the soil surfaces failed to materially alter the trend of germination for R. viscosissimum seed. Germination of white pine seed did not extend beyond the third growing season.

TABLE 7

NUMBER OF SEED GERMINATING ON DISTURBED AND UNDISTURBED SOIL SURFACES WHEN CALCULATED ON THE BASIS OF TOTAL AREA SOWN PER SPECIES IN EACH PLOT

Surface	Status of Surface	R. lacustre			R. viscosissimum			White Pine		
		Full Sun	Half Shade	Full Shade	Full Sun	Half Shade	Full Shade	Full Sun	Half Shade	Full Shade
Duff	Disturbed	0	17	470	0	0	18	0	0	0
	Undisturbed	0	3	25	0	0	0	0	0	0
Mineral	Disturbed	0	22	578	0	0	23	0	0	0
	Undisturbed	0	5	30	0	0	0	0	0	0
Burned-Mineral	Disturbed	0	10	75	0	0	13	0	0	0
	Undisturbed	0	2	12	0	0	0	0	0	0

Table 7 shows the number of species of seeds germinating on the disturbed and undisturbed surfaces of duff, mineral and burned-mineral soils under the three intensities of light. Each value has been raised to the area-basis representing five subplots for ease of comparison. As the removal of ribes was timed to correspond with initial ribes eradication on recent cutover lands, the resulting disturbance was responsible for considerable germination of R. lacustre seed under conditions of full shade. The only seed of R. viscosissimum germinating is observed to be under conditions of full shade. The conclusion can be drawn therefore that length of time seed will remain viable where stored under natural conditions is dependent upon conditions of soil moisture, soil temperature, and upon aeration. Under the extreme soil temperature and desiccated conditions of full sun ribes seeds appear to lose viability within a relatively few years. With a lowering of soil temperature toward conditions of full shade the period during which ribes seeds remain viable is significantly extended. The mineral surface under both half and full shade conditions was most favorable for longevity of ribes seeds followed by the duff and burned-mineral surfaces. The duff surface affords protection in that ribes seeds filter down through the loose organic material and come to rest well buried within the insulating layer where soil temperature and moisture are held rather

constant. The above knowledge assumes particular importance in the coordination of ribes ecology with timber management practices in the western white pine type. Practical application of knowledge gained from this study is given in the summary section of this report.

Longevity of Ribes Seeds as Affected by Change of Environmental Conditions Resulting from Cutting of Mature Timber

Ribes seeds in storage beneath the humus layer of the forest floor are capable of retaining viability for a period at least equal to the life of a timber stand. Much of these stored ribes seeds germinate upon harvesting of the maturing forest crop. Germination results from a disturbance of the forest floor and the increase of light which raises soil temperature upon removal of the canopy. Since logging does not result in 100 percent disturbance of the forest floor much ribes seed remains on the areas unaccounted for in or beneath the undisturbed organic material. This study has been undertaken to determine the status of such seed following the drastic change of environmental conditions brought about by cutting of the mature timber.

The long period of viability for ribes seeds results from the protection afforded by the insulating layer of organic material on the soil and the closed timber canopy. Both are responsible for maintenance of fairly constant conditions of soil moisture, soil temperature and the exchange of soil gases. Upon breaking of a forest canopy as by cutting and/or a disturbance of the forest floor environmental conditions under which ribes seed have been in storage are materially altered. The degree of this alteration is governed by the extent to which the canopy is removed and a disturbance made of the forest floor from logging operations. Soil temperatures rise as more sunlight permeates through to the forest floor as a result of cutting. With increased soil temperatures as a direct result of more sunlight reaching the forest floor soil moisture decreases through evaporation. Disturbing the forest floor results in aeration and the exposure of stored ribes seed for germination.

In order to interpret the regenerational problem of ribes in the sustained-management of partial white pine cuttings plots were established this past season on the Kaniksu, Coeur d'Alene and St. Joe Forests. The question is to determine what and for how long a potential problem of ribes regeneration exists on these areas following the bulk of seed germination after the initial cut of mature volume. Of particular interest will be the effects of drastic environmental changes brought about by cutting upon the viability of ribes seed failing to germinate within a short interval after cutting. General observations indicate that viability of ribes seed decreases as years from time of logging or shortly thereafter increase. There is a possibility that a large proportion of the stored ribes seed germinates but never becomes visible as established seedlings because germination occurred at a soil depth greater than the length of the seedling hypocotyl. Again it seems quite apparent that a large proportion of the ungerminated seed retains viability for many years following cutting and the resulting change of environment.

A Latin Square plot having a dimension of seven milacres was employed for this

study. Each tier of seven milacres has been established separately to avoid areas of burned slash piles and major skid trails. One milacre was selected by random drawing as a check and another for 100 percent disturbance. Ribes were first removed from each milacre and the number of bushes recorded. Regeneration from this disturbance will be followed on six of the seven milacres in each tier until an additional milacre is scheduled for disturbance. On the milacre selected at random for disturbance all vegetative growth was removed. The ground was then thoroughly chopped with a Pulaski tool and raked until the humus became smoothly mixed with about ½ inch of top soil. Every two years an additional milacre will be similarly prepared to study the number of ribes seedlings germinating and period of viability of stored seed following cutting. Five milacres remain in each tier of seven for future disturbance at two-year intervals. This study will be supplemented with the collection and extraction of ribes seeds for germination tests from areas representing cutting of various ages. Plots have now been established in the LaClerc Creek drainage of the Kaniksu; Iron Creek, Potter Creek and Sands Creek on the Coeur d'Alene Forest and in the Merrie Creek drainage on the St. Joe Forest. Additional series will be established throughout the region next season for wider coverage of ecological conditions and intervals after cutting.

C. Tests of Ammonium Sulfamate for Ribes Eradication.

Results of the 1943 fall series of sulfamate spray plots were recorded in early June and confirmed by periodic inspections during the field season. Data in table 8 show that all dosages from 1 to 8 pounds per milacre killed 100 percent of the R. lacustre. Several R. petiolare plants on the 3-pound dosage plot were killed. These results show ammonium sulfamate to be a highly promising herbicide on stream-type R. lacustre.

During the field season of 1944, six dosages of ammonium sulfamate (1/2 to 6 lbs. per milacre) were applied to R. lacustre plots in the immediate vicinity of the 1943 plots on Crystal Creek, St. Joe National Forest. These dosages were replicated in early June, mid-July, and early September. A summary of data for the 1944 tests at Crystal Creek is given in table 9.

Observations made late in the season indicated that ammonium sulfamate was again exhibiting high toxicity to R. lacustre and that early and late season treatments might prove to be more effective than mid-season treatments. Although no conclusion can be reached on this latter point until the plots are examined next year, it might be noted that combined observations in California and Idaho suggest that low soil moisture and high soil temperature tend to reduce the effectiveness of ammonium sulfamate as a herbicide.

Sulfamate tests were also made on R. viscosissimum located at the head of the LaClerc Creek drainage, Kaniksu National Forest. Data on these tests appear in table 10 and show that R. lacustre was also present on the plots. Early in September observations indicated that R. viscosissimum might not be as susceptible to ammonium sulfamate as stream-type R. lacustre and that this ecologic form of R. lacustre (Crystal Creek plots) appeared to be more sus-

ceptible to sulfamate than the upland-type R. lacustre occurring on the LaClerc plots.

On September 9, in addition to the spray tests reported in table 10, several large and rockbound bushes of R. lacustre and R. viscosissimum were treated with ammonium sulfamate spray (1 lb. of chemical per gallon of water). Four large R. viscosissimum and 5 clumps of R. lacustre were located on the uphill side of the motor road at the head of the drainage about 1/4 mile on the Idaho side from the summit of the LaClerc Creek divide. Treatment was made in what might be called a "practical manner" to determine the effectiveness of this chemical on large, rockbound bushes. Dosage was estimated to be about 3 pounds per milacre. All treated bushes or clumps were marked by a numbered stake.

TABLE 8

RESULTS OF 1943 SPRAY AND SOIL DRENCH TESTS (FALL SERIES) OF AMMONIUM SULFAMATE ON R. LACUSTRE, CRYSTAL CREEK, ST. JOE NATIONAL FOREST

Plot No.	Ribes Data (Per Milacre)			Pounds of Chemical Per Milacre	Percent Kill[1]	
	No. of Bushes	Feet of Live Stem	Percent of Plot Occupied by Ribes		Bushes	Live Stem
3	11	250	45	1[2]	100	100
1	18	550	65	2	100[3]	100
5	13[4]	500	85	3	100	100
2	16	375	80	5	100	100
6	13	400	70	6	100	100
4	18	600	80	8	100	100

1/Grass and shrubby vegetation associated with ribes were largely killed by dosages in excess of 2 pounds. Brush killed included rose, alder, dogwood, and elderberry. All plots were treated on September 9, 1943.

2/Two gallons of water used; all other dosages dissolved at rate of 1 gallon of water for each pound of chemical.

3/One small R. lacustre survived along margin of plot in heavy sod.

4/In addition to the R. lacustre there were three R. petiolare with 25 FLS. All killed.

TABLE 9

1944 SPRAY AND SOIL DRENCH TESTS OF AMMONIUM SULFAMATE ON R. LACUSTRE CRYSTAL CREEK, ST. JOE NATIONAL FOREST

Plot No.	Ribes Data (Per Milacre) Percent of Plot Occupied by Ribes	Feet of Live Stem	Dosage (Per Milacre) Lbs. of Chemical	Gals. of Water
Spring series[1]				
7	30	350	2	2
8	20	200	1	2
9	60	600	3	3
10	40	600	4	4
11	20	200	1/2	1
12	50	500	6	6
Summer series[2]				
13	75	1,050	1/2	1
14	55	875	1	2
15	40	650	2	2
16	60	950	3	3
17	40	575	4	4
18	60	700	6	6
Fall series[3]				
19	40	450	6	6
20	30	325	2	2
21	40	350	3	3
22	25	250	1	2
23[4]	15	175	1/2	1
24[5]	40	400	4	4

1/Applied June 10.

2/Applied July 18.

3/Applied September 5.

4/Also R. petiolare (60 FLS).

5/Also R. petiolare (25 FLS).

TABLE 10

1944 SPRAY AND SOIL DRENCH TESTS OF AMMONIUM SULFAMATE ON R. VISCOSISSIMUM AND UPLAND R. LACUSTRE, LACLERC DRAINAGE, KANIKSU NATIONAL FOREST

Plot No.	Ribes Data (Per Milacre)		Dosage (Per Milacre)	
	No. of Bushes	Feet Live Stem	Lbs. of Chemical	Gals. of Water
Spring series 1/				
1	29 V. 1 L.	232 8	4	4
2	37 V. 1 L.	240 4	2	2
3	43 V. 1 L.	250 7	1	1
4	34 V. 2 L.	272 40	1/2	1
Fall series 2/				
5	26 V. 1 L.	425 25	4	4
6	14 V. 17 L.	125 225	3	3
7	18 V.	275	6	6

1/ Applied June 14.

2/ Applied September 9.

VII. LABORATORY, GREENHOUSE, AND SPECIAL ACTIVITIES

The laboratory, greenhouse, and ribes garden at Berkeley were actively maintained throughout 1944 without the benefit of part-time assistants. Laboratory and greenhouse facilities at Moscow were used to stratify and to pre-germinate a number of lots of western white pine seed for planting tests.

Special activities at Berkeley and at Spokane during the year have included: (1) Compilation and analysis of disease study data for the purpose of devising a dependable sampling method for use in running a partial check of large field plots. (2) Preparation of reports for the Forest Service on blister rust control in relation to management of western white pine. (3) Compilation and analysis of data on ten years of tests on germination of ribes seeds. (4) Laboratory and greenhouse tests on factors affecting the germination of ribes seeds. (5) Chemical tests for the identification of infection zone in tissue of white pine and sugar pine. Field tests undertaken in July with alpha-naphthol on freshly cut cankers showed definite indication of abnormal tissue in both proximal and distal zones beyond the limits of bark discoloration visible to the naked eye. Tests for nitrate (diphenylamine reagent) and for phosphate (ammonium molybdate reagent) in the bark and stem cambium of infected branches showed an accumulation of these two nutrients in the proximal zone of the canker. (6) Toxicity tests with various plant hormones and mixtures of hormones with ammonium sulfamate, ammonium thiocyanate and sodium chlorate. A new technique was worked out using Lemna minor (duckweed) for rapid evaluation of the toxicity of these new herbicides. The more promising herbicides were then tested by treating greenhouse grown barley plants; herbicides showing high toxicity to barley were then tested on ribes plants. As a result of these tests two new herbicidal mixtures consisting of (a) ammonium sulfamate, phenylacetylene and furfural and (b) ammonium sulfamate and glycerine were tested in the field in California. (7) New equipment was devised and tested for comparing the barium nitrate equilibrium method with the standard sunflower technique for measuring the permanent wilting percentage of soils. Results to date with this new equipment showed agreement within 1 or 2 percent of the sunflower method. For the forest soils tested, R. roezli has previously been shown to reach the permanent wilting point slightly below that of the sunflower. Thus the new method should meet our requirements nicely. (8) Cooperation in field activities on barberry eradication, control of pear Psylla and eradication of poison oak at Camp Adair, Oregon.

In addition to the above work, the following processed or printed reports were made available to Blister Rust personnel during the calendar year of 1944:

Serial No. 121:

"A Study of the Effects of Aeration on the Germination of Ribes Seeds During and Following Stratification.

.....L. P. Winslow

Serial No. 122:
"Observations on the Regeneration of Upland-Type Ribes in White Pine Areas of the United States.

.....H. R. Offord

Self-Incompatibility in Several Species of Ribes in the Western States. Journ. Agric. Research 68: 65-71 (1944).

.....H. R. Offord,
Clarence R. Quick and
Virgil D. Moss

The Effects of Snowbrush on the Growth of Sierra Gooseberry. Journ. Forestry 42: 827-832 (1944).

.....Clarence R. Quick

Damage to Conifers in Northern Idaho by the Richardson Red Squirrel. Journ. Forestry 42: 143-144 (1944).

.....C. R. Stillinger

Notes on Cronartium Occidentale. Northwest Science XVIII No. 1: 11-16 (1944)

.....C. R. Stillinger

PHOTOGRAPHIC AND EDUCATIONAL WORK, 1944

By
Frank O. Walters, Assistant Regional Leader
H. Miller Cowling, Photographic Specialist

During the year 1944 the essential elements of the education and photographic section received as much attention as time facilities permitted.

The services of the photographic section were extended to the Sugar Pine Region and the Pear Psylla Control.

A. Photographic Section

The purpose of this section is: (1) To maintain a pictorial record of control and investigative work, (2) to supply photographs, charts, maps and manuals for facilitating the field work, and (3) supply material for educational purposes.

All the work during 1944 was held to a minimum, covering only those subjects which were judged essential to the program.

Although photography is the major project of this section production of material also involves Multilith offset printing, black-line printing and mimeograph work. A summary of the 1944 work is given in the following table:

PHOTOGRAPHIC, MULTILITH, BLACK-LINE AND MIMEOGRAPH WORK

Item	Northwestern Region	Sugar Pine Region	Pear Psylla Control	Total
PHOTOGRAPHIC				
Lantern slides, natural color	126			126
Films developed, rolls or packs	5	1	4	10
Films developed, field films	196		29	225
Copies, 5x7	35	1	149	185
8x10	5	1	45	51
Printing, 4x5 or smaller	54	102	185	341
5x7	3,031	140	158	3,329
8x10	8	21	2	31
9x11	384	16	531	931
Enlarging, 11x14 or smaller		10	93	103
16x20	2	7	3	12
20x24	6		9	15
Total Items	3,852	299	1,208	5,359
MULTILITH				
Copies	51	44	17	112
Plates made	53	49	33	135
Cards printed	8,300	2,000	77,200	87,500
Cards printed, reverse	4,000	2,000	77,200	83,200
Total cards	12,300	4,000	154,400	170,700
Paper printed	11,300	30,100	72,600	114,000
Paper printed, reverse	2,000	8,000	29,000	39,000
Total paper	13,300	38,100	101,600	153,000
Total Items	25,704	42,193	256,050	323,947
BLACK-LINE PRINTER				
Total maps, printed	629		3,143	3,772
MIMEOGRAPH				
Total paper	34,430			34,430
Grand Total All Items	64,615	42,492	260,401	367,508

B. Educational Section

Practically all members of the technical staff contributed to the educational phase of the program. As many of the workers were from distant parts of the country an excellent opportunity was available for a wide dissemination of information relative to Blister Rust Control. Informal discussions and talks were carried on in most camps as well as considerable on-the-job education.

Nation-wide use is being given some of the photographic studies depicting the regeneration and growth of white pine over a period of years. Pictures of such studies appeared in an American Forest Products publication, The Timberman, The Tenth Biennial Report of the State Forester, State of Idaho. One series was also used in the material presented to the Budget Bureau.

Several motion picture shots have been taken and will be included in the western blister rust film as a means of improving the picture.

1. Bulletins and posters. Bulletins and literature were made available to all camps. Distribution of 137 bulletins was made to persons calling at the Spokane office and 500 were given out at the Spokane County Fair.

   Posters were displayed in most of the camps.

2. Talks, slides and motion pictures. Talks on blister rust were given at Baxter General Hospital and the Sandpoint Kiwanis Club. Slides were used in one talk.

   A wider use was made of motion pictures this year than for some time.

   A pickup truck equipped with a power generator made the rounds of the camps showing the western blister rust film as well as other forestry films. Numerous other showings were made before various groups. A total of 47 showings was made before 1,915 people. The Northeastern Region reports that during the past two years the Western Blister Rust film being used in the East has had 52 showings before 5,902 people.

   One diorama setup made at the Spokane County Fair was well received.

APPROPRIATIONS
BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE
NORTHWESTERN REGION

Regular Appropriations

Fiscal Year 1944:

Project 3101.14 (Administrative)	$93,700.00	
Project 3103.14 (Cooperative)	68,538.00	
		$162,238.00

Fiscal Year 1945: (as of 12/31/44)

Project 3101.14 (Administrative)	$88,675.00	
Project 3103.14 (Cooperative)	64,870.00	
		$153,545.00

Contributed Funds: (deposited with U. S. Treasury)

State of Idaho		$15,000.00	
Clearwater Timber Prot. Assn.	$6394.50		
Potlatch Timber Prot. Assn.	4959.06		
Priest Lake Timber Prot. Assn.	4259.42	15,612.98	
			$30,612.98

TABLE 1

FEDERAL EXPENDITURES, NORTHWESTERN REGION OF BLISTER RUST CONTROL, CALENDAR YEAR 1944, REGULAR APPROPRIATIONS

	Project	Salaries	Expense	Total
	January 1 to June 30, 1944			
I	Planning, Coordination and Technical Direction			
	1.1 - Clearwater Operation, Idaho	$ 7,452.78	$1,104.28	$ 8,557.06
	1.2 - St. Joe Operation, Idaho	8,364.68	1,095.36	9,460.04
	1.3 - Coeur d'Alene Operation, Idaho	1,892.11	54.57	1,946.68
	1.4I - Kaniksu Operation, Idaho	6,092.52	786.68	6,879.20
	1.6C - Cabinet Operation, Montana	957.06	141.70	1,098.76
	1.6K - Kootenai Operation, Montana	957.06	62.67	1,019.73
	1.7G - National Park, Glacier	172.01	84.36	256.37
	1.7R - National Park, Rainier		31.98	31.98
	1.A - Office Maintenance	9,881.25	2,619.31	12,500.56
	1.B - Supervision	5,028.24	208.15	5,236.39
	1.C - Education and Information	1,561.34	147.42	1,708.76
	1.D - Control Investigations	2,321.12	61.00	2,382.12
	1.E - Methods Development		19.28	19.28
	Total, Project 1, January 1 to June 30, 1944	$44,680.17	$6,416.76	$51,096.93
III	Cooperative Ribes Eradication on State and Private Lands			
	3.1 - Clearwater Operation, Idaho	3,350.73	2,919.44	6,270.17
	3.2 - St. Joe Operation, Idaho	9,538.37	10.00	9,548.37
	3.4I - Kaniksu Operation, Idaho	2,625.66	2,192.41	4,818.07
	Total, Project III, January 1 to June 30, 1944	$15,514.76	$5,121.85	$20,636.61
	July 1 to December 31, 1944			
I	1.1 - Clearwater Operation, Idaho	5,765.12	778.67	6,543.79
	1.2 - St. Joe Operation, Idaho	6,628.70	1,268.62	7,897.32
	1.3 - Coeur d'Alene Operation, Idaho	1,229.09	63.97	1,293.06
	1.4I - Kaniksu Operation, Idaho	*1,721.27	821.71	2,542.98
	1.6C - Cabinet Operation, Montana	** 163.68	100.79	264.47
	1.6K - Kootenai Operation, Montana	** 163.68	84.11	247.79
	1.7G - National Park, Glacier	344.02	7.36	351.38
	1.7R - National Park, Rainier	344.02	76.35	420.37
	1.7Y - National Park, Yellowstone	498.46	158.69	657.15
	1.A - Office Maintenance	9,707.45	2,440.66	12,148.11
	1.B - Supervision	4,943.69	648.66	5,592.35
	1.C - Education and Information	1,561.34	59.11	1,620.45
	1.D - Control Investigations	731.47	51.65	783.12
	1.E - Methods Development		14.06	14.06
	Total, Project I, July 1 to December 31, 1944	$33,801.99	$6,574.41	$40,376.40
III	3.1 - Clearwater Operation, Idaho	19,726.64	6.83	19,733.47
	3.2 - St. Joe Operation, Idaho	20,022.51	100.00	20,122.51
	3.4I - Kaniksu Operation, Idaho	18,945.76	38.98	18,984.74
	Total, Project III, July 1 to December 31, 1944	$58,694.91	$ 145.81	$58,840.72

*Net amount after crediting repayment by the Forest Service of the salaries of H. A. Brischle and L. J. Easley for the period 7/1-12/31/44.

**Net Amount after crediting repayment by the Forest Service of the salary of A. S. Skoglund for the period 7/1-11/30/44.

TABLE 2

SUMMARY OF EXPENDITURES FROM STATE AND PRIVATE FUNDS, 1928 - 1944, IDAHO

Year	State	Private	Total
1928	$ 2,518.55	$ 2,264.32	$ 4,782.87
1929		19,027.66	19,027.66
1930		20,000.00	20,000.00
1931	5,000.00	35,905.32	40,905.32
1932	8,003.43	11,186.33	19,189.76
1933			
1934	29,154.06		29,154.06
1935	15,000.00		15,000.00
1936	16,998.25		16,998.25
1937	15,001.25		15,001.25
1938	15,000.44		15,000.44
1939	15,438.04		15,438.04
1940	10,034.48		10,034.48
1941	7,542.73	15,756.40	23,299.13
1942	22,761.68	15,440.78	38,202.46
1943	12,252.13	386.68	12,638.81
1944	12,506.60	15,612.98	28,119.58
Total	$187,211.64	$135,580.47	$322,792.11

Organization of the Northwestern Regional Office

1. Regional Leader in Charge, H. E. Swanson, Pathologist

2. Assistant Regional Leader, F. O. Walters, Pathologist

3. Cooperative Local Control:

   a. Clearwater Operation, Idaho:
      Operation Supervisor, H. J. Faulkner, Forester
      Checker Foreman, J. C. Gonyou, Field Aid
   b. St. Joe Operation, Idaho:
      Operation Supervisor, F. J. Heinrich, Pathologist
      Assistant Operation Supervisor, W. F. Painter, Pathologist
      Camp Superintendent, G. W. Schmaltz, Agent
      Special Duty Assistant, R. E. Myers, Agent
   c. Coeur d'Alene Operation, Idaho:
      Operation Supervisor, M. C. Riley, Forester
   d. Kaniksu Operation Idaho-Washington:
      Operation Supervisor, H. A. Brischle, Pathologist
      Assistant Operation Supervisor, L. J. Easley, Agent
   e. Montana Operation:
      Operation Supervisor, A. S. Skoglund, Pathologist
   f. National Parks:
      Operation Supervisor, M. C. Riley, Forester
      C. M. Chapman, Pathologist

4. Projects:

   a. Education and Information:
      H. M. Cowling, Photographic Specialist
   b. Methods Development and Control Investigations: Work Project BLR-1-6
      V. D. Moss, Forest Ecologist
      J. F. Breakey, Pathologist
      C. R. Stillinger, Pathologist

   (Personnel assigned to Northwestern Region by H. R. Offord)

5. Business Administration and Clerical:

   a. E. G. Schmidt, Administrative Assistant
      E. K. LaPrey, Storekeeper
      L. C. Miller, Automobile Mechanic
   b. M. L. McWold, Administrative Assistant
      M. Wilson, Clerk
   c. M. M. McLean, Clerk-Stenographer
      D. W. Boyer, Clerk-Stenographer
      B. J. Coon, Clerk-Stenographer
   d. L. E. Klatt, Administrative Assistant - Personnel

Members of the Permanent Staff on Military Furlough: CCM John C. Gynn, Forester; Cpl. Homer J. Hartman, Pathologist; Capt. Edward L. Joy, Forester; Lt. Howard D. Langley, Administrative Assistant; Major Albert L. Pence, Jr., Forester; Y 3/c Jean R. Pringle, Clerk-Stenographer.